PAPER TRADE JOURNAL

Vol. XCVI FEBRUARY 16, 1933 No. 7

1833 CENTENNIAL 1933

BULKLEY DUNTON & COMPANY

75-77 Duane Street

NEW YORK, N. Y.

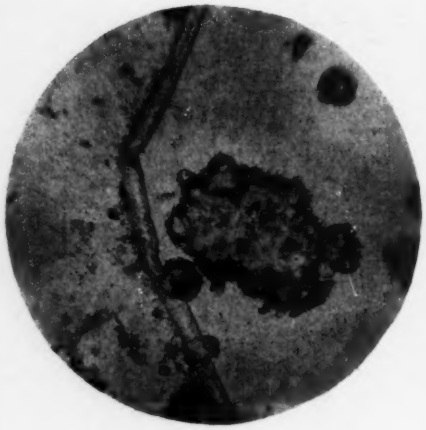
PULP PAPER FELTS

1833 CENTENNIAL 1933

THE MICROSCOPE TELLS THE STORY

Would you expect the same results from these two rosin-wax sizes?

Bennett Size: Photomicrograph (X 100) of paper stock containing Bennett Rosin-Wax Size. Note the single paper fibre surrounded by tiny, evenly distributed particles of size.



Just as Good? Photomicrograph (X 100) of paper stock containing another rosin-wax size. Note the agglomeration of large, crudely emulsified wax particles near the paper fibre.

BENNETT

TRADE MARK

ROSIN-WAX SIZE

The successful use of wax in paper sizing depends largely on the quality of the dispersion employed, and most of the unsatisfactory results obtained can be traced to course, unstable emulsions.

The high quality of wax sizes made by the Bennett Process is the result of five years of continuous research and progressive improvement.

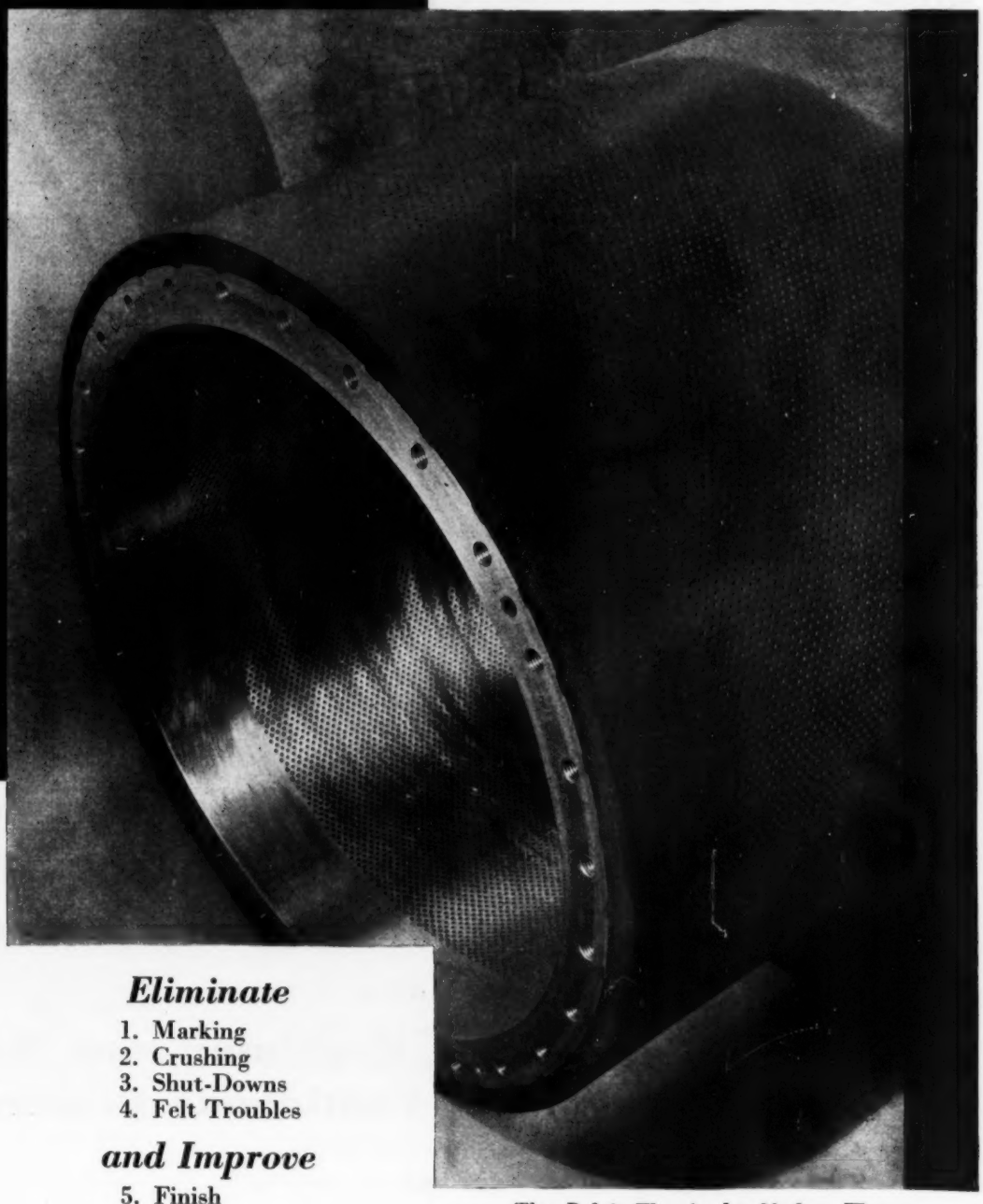
It is for this reason that the use of Bennett Rosin-Wax Sizes showed a substantial increase during 1932, despite the depressed condition of the paper industry.

Bennett Incorporated
CAMBRIDGE, MASS., U. S. A.

Bennett Limited
CHAMBLY CANTON, P. Q., CANADA

Entered as second-class matter, March 3, 1925, at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices: 15 W. 47th St., New York, N. Y.

BELOIT
RUBBER-COVERED SUCTION ROLLS



Eliminate

1. Marking
2. Crushing
3. Shut-Downs
4. Felt Troubles

and Improve

5. Finish
6. Quality
7. Efficiency

Send for special "Rubber-Covered Suction Roll" Bulletin. It gives valuable information regarding various installations.

The *Beloit* Way is the *Modern* Way

BELOIT

BELOIT IRON WORKS
BELOIT, WIS., U. S. A.

BEKK *COMBINED* MEASURING APPARATUS
FOR THE DETERMINATION OF
SMOOTHNESS AND POROSITY
IN PAPER

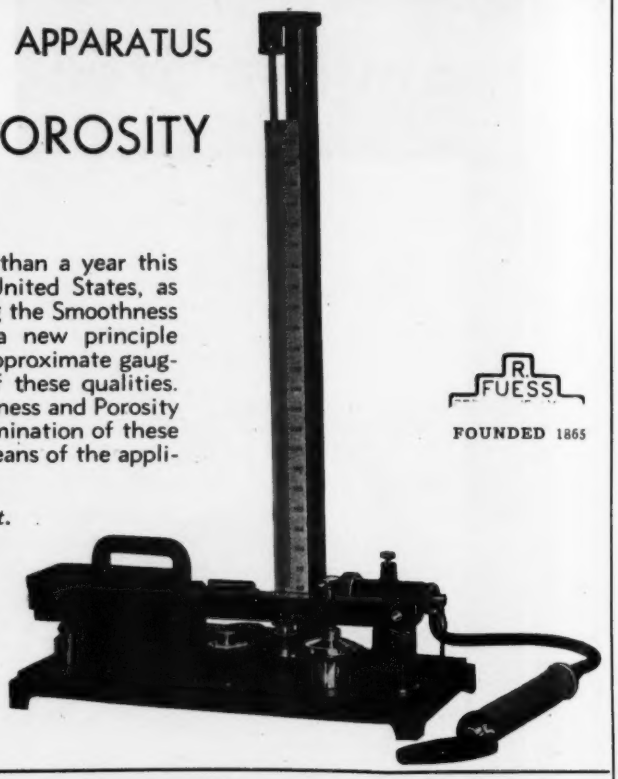
During the comparatively short period of less than a year this instrument has achieved recognition, in the United States, as the ultimate present-day device for determining the Smoothness and Porosity of paper. The application of a new principle evolved by Dr. Bekk definitely supersedes the approximate gauging hitherto in vogue for the determination of these qualities. A highly sensitive instrument, the Bekk Smoothness and Porosity Tester effects a quick, simple, numerical determination of these important factors with scientific accuracy by means of the application of atmospheric pressure.

Further information on request.

R. FUESS, Inc.

Instruments for Scientific Research and Industrial Control
245 West 55th Street New York
Works: Berlin-Steglitz, Germany

IN THE MANUFACTURE OF FUESS INSTRUMENTS, PRODUCTION IS SUBORDINATED TO PRECISION.



R FUESS
FOUNDED 1865

Announcing:-

Two new additions to the Trimbey Line of Control Apparatus

The "TRIMBEY - WITHAM JR."
Continuous Freeness Indicator and Recorder

and also

Automatic Consistency Regulator and Water Supply Control For Continuous Beaters

TRIMBEY MACHINE WORKS
Glens Falls, N. Y.

Eliminating the Guesswork from Stainless Steel Specifications

USS 25-12
for resistance to high temperatures

USS 25-12 is highly resistant to a wide variety of corrosive agents, and especially to an appreciable amount of sulphur in surrounding gases.

It is austenitic and hence not intended for those applications requiring hardening by heat treatment. Its ductility is such as to provide for a considerable amount of drawing and forming.

USS 25-12 is the ideal steel for most high temperature services. It does not oxidize rapidly below 2100 degrees F., and in addition, retains a large proportion of its strength and toughness throughout its range of application.

Other USS Stainless and Heat Resisting Steels are:

Chromium Alloy Steels		Chromium Nickel Steels
Ferritic		*Austenitic*
USS 12 & 12Z		*USS 18-8*
USS 17		*USS 18-12*
USS 27		*USS 25-12*

Illinois Steel Company
CHICAGO, ILLINOIS

CARNEGIE STEEL COMPANY
PITTSBURGH, PA.

SUBSIDIARIES OF
UNITED STATES STEEL CORPORATION

In this day when public demand for stainless steel has become so insistent, manufacturers are faced with the task of selecting from the many types of Stainless Steel, the one most ideally suited to specific needs.

Such selection involves consideration of the variation in corrosion-resistant characteristics of the various types as well as careful analysis of the physical characteristics as to strength and workability.

Our metallurgists will be glad to work with you in the necessary studies and in specifying the ideal Stainless Steel for your needs.

USS STAINLESS AND HEAT RESISTING STEELS

† CHROMIUM-NICKEL ALLOY STEELS ARE PRODUCED UNDER LICENSES OF THE CHEMICAL FOUNDATION, INC., NEW YORK, AND FRIED. KRUPP A. G. OF GERMANY

Effort Not Worry

Will improve conditions.

Only by consistent, coordinated effort and investigation do we improve our position.

Study your felt cost per ton and resolve to try **TENAX FELTS** at once and improve cost per ton through improved finish and improved life.

TENAX FELTS in all styles for all purposes.

This wonderful felt is made endless in all lengths consistent with the needs of tomorrow.

No hit or miss methods used in producing this wonderful felt.

NON-USERS ARE THE LOSERS

LOCKPORT FELT COMPANY

NEWFANE, N. Y.

"CERTIFIED" PERFORMANCE SURVEYS

Prove that

Last 3 to 6 times Longer

To prove our claims that Asten Asbestos Felts really last longer, we had an independent firm of engineers, send their men into mills using our Dryer Felts and find out how they compare, in service, with other felts. The results of these investigations are conclusive.

We would like to send you copies of the reports, as well as some letters of praise received by us from other mills. Users' opinions ARE the best recommendations.

Made in U. S. A.

ASTEN-HILL Mfg. Co. Philadelphia

Chromium-plated Suction Box Covers

¶ *Reduce costs*
¶ *Increase operating efficiency*
¶ *Prolong wire and felt life*
¶ *Improve quality of product*

INCREASED WIRE LIFE . . . . . Performance records of a paper machine operating at from 650 to 800 feet per minute indicate an average increase in wire life of 30% by use of CRODON-plated covers. Another high-speed machine increased wire life 50%.

NORMAL
CRODON

LONGER FELT LIFE . . . . . A mill using CRODON-plated covers reports that suction has been doubled, felt life increased 30%, and a sheet obtained with 1½% to 2% less moisture.

NORMAL
CRODON

IMPROVED SUCTION EFFICIENCY . . . .

NORMAL
CRODON

FREEDOM FROM CLEANING . . . . . Another mill found it necessary to clean wooden covers once a week: after installing CRODON-plated covers in the same machine, no cleaning whatsoever was necessary during one and one-half years of actual running time.

NORMAL
CRODON

HARDNESS OF SURFACE . . . . . Chromium is the hardest metallic surface available—nine-tenths as hard as the diamond. This provides protection against wear and abrasion.

COPPER
IRON
CRODON

REVERSIBILITY . . . . . CRODON-plated metal suction box covers may be made reversible—after one side has served its useful life the cover may be turned over; thus obtaining, in effect, a new cover.

ONE SIDE
BOTH SIDES

EXTREME SMOOTHNESS . . . . . The remarkable smoothness of a CRODON-plated and highly polished surface is of particular advantage here, where the very minimum of friction is desired. This results in marked decrease in wear of wire and felt, and materially prolongs their life.

NORMAL
CRODON

The most successful applications in the paper industry are on suction box covers, screen plates, press rolls, drying drums, printing rolls, calender rolls, embossing rolls, evaporator tubes and numerous other equipment where decreased wear, elimination of corrosion and extreme smoothness are desired. These are described in Booklet No. 6, a copy of which will be furnished upon request.

The trade-mark CRODON assures the best in chromium plate.

Investigate the many definite economies made possible by CRODON. May we have the privilege of assisting you?

Chromium Corporation of America

***Executive Offices*—120 BROADWAY, NEW YORK**

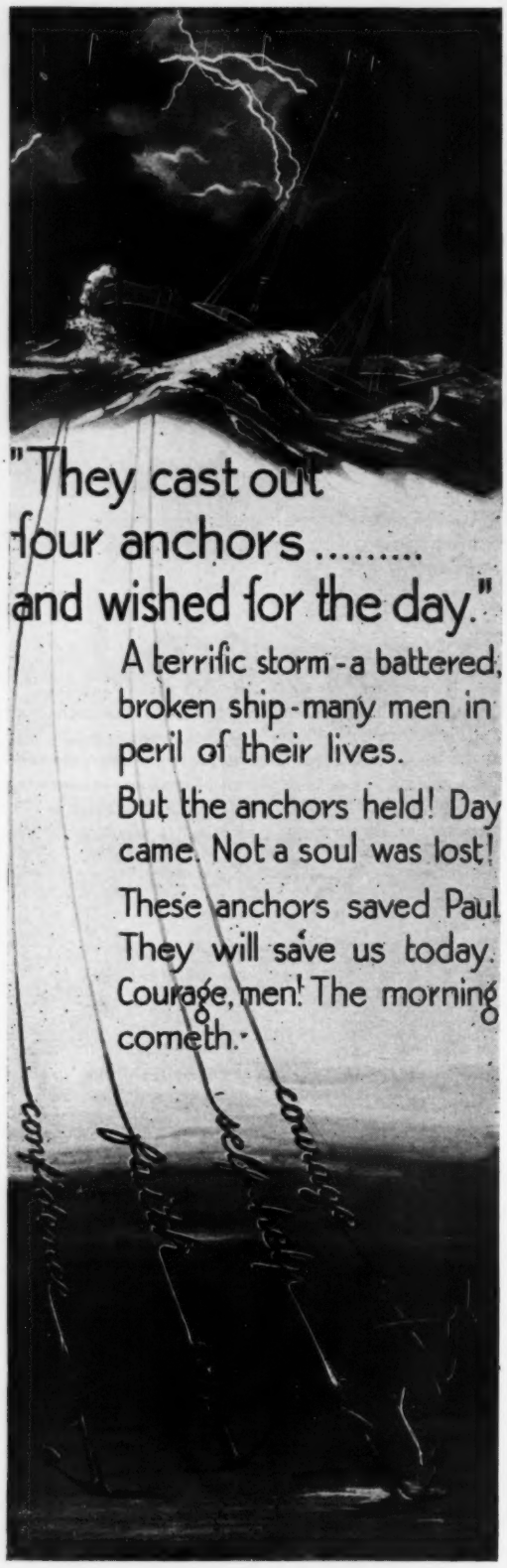
Waterbury Plant
P. O. Box 822
WATERBURY, CONN.

Cleveland Plant
3125 PERKINS AVE.
CLEVELAND, OHIO

CRODON
The Chrome Plate
TRADE MARK REG. U.S. PAT. OFF.

Chicago Plant
4645 WEST CHICAGO AVE.
CHICAGO, ILL.

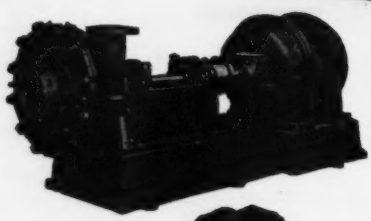
Milwaukee Plant
187 EAST BECHER ST.
MILWAUKEE, WIS.


"They cast out four anchors ..... and wished for the day."
A terrific storm - a battered, broken ship - many men in peril of their lives.
But the anchors held! Day came. Not a soul was lost!
These anchors saved Paul They will save us today. Courage, men! The morning cometh.

KALAMAZOO VEGETABLE PARCHMENT COMPANY
PARCHMENT (KALAMAZOO COUNTY) MICHIGAN

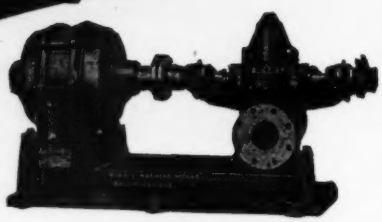
A pump for every service

MORRIS NON-CLOGGING PUMP
Notice the split case and suction handhole for convenient inspection, and the heavy duty bearing.



MORRIS PUMP FOR CHEMICAL SOLUTIONS
These pumps are provided with exterior adjusting nuts to take up wear from the outside.

MORRIS CLEAR WATER PUMPS
The wide range of impellers available for these pumps permits operation at suitable speed with maximum efficiency.



MORRIS Centrifugal Pump designs are based on over two generations of service in pulp and paper mills.

Each Morris Pump type, whether for pulpy mixtures, corrosive solutions, or clear water, has been specially developed for the *exact* characteristics of the material to be handled.

Morris non-clogging pumps have exceptionally large passages in suction inlet, impeller and casing, with carefully proportioned gradations of cross sectional areas to handle thick stock efficiently without separation of water from the pulp. Morris pumps for chemical mixtures have renewable wearing parts made of special materials for long wear and ready, economical renewal, and have massive running parts to handle heavy liquids at high heads. Morris clear water pumps have exceptionally high efficiency and are also suitable for many mill processes.

A new bulletin briefly outlining the many Morris Pump types for pulp and paper mill service has recently been published and contains much data of interest and value to mill executives and engineers. Copies will be sent on request.

Morris Machine Works, Baldwinsville, N. Y.
Originators of Centrifugal Pumps, both single and multi-stage, and builders for practically all purposes since 1864
New York, Charlotte, Huntington, W. Va., Houston

MORRIS
CENTRIFUGAL PUMPS

HOW VALUE IS ASSURED IN EVERY HAMILTON FELT

And now to make the wool natural again . . .

AFTER the felt is completed—fulled, dried, stretched, and napped — it is almost bone dry. Yet, in its natural state wool has a great affinity for water. It is very hygroscopic and at its best when it contains as much moisture as the atmosphere.

The illustration shows a section of the Conditioning Room, which Shuler & Benninghofen use to bring the moisture content of the felt up to that of the atmosphere quickly. The whirling disc above the door is the heart of the system. It is the Humidifier, which sprays moisture into the room constantly.

A few hours in this room and the wool in the felt becomes itself again — stronger, more flexible, and better.

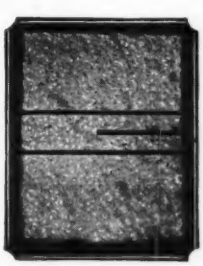
In this Conditioning Room also, the felt is given its final inspection.

Try one Hamilton Felt. Put it in competition with other felts on your hardest machine and check the results carefully. You'll soon be specifying Hamilton Felts regularly and using them on all your machines.

SHULER & BENNINGHOFEN, Hamilton, Ohio

Miami Woolen Mills, Established 1858

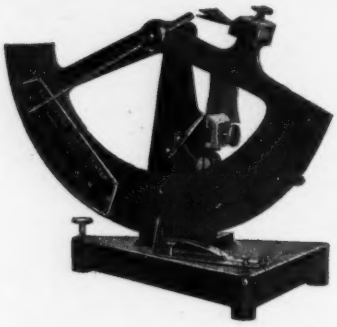
Hamilton Felts



Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Elmendorf

The Standard Tearing Strength Test



The Elmendorf Tester has contributed generously to the technical data of the paper, pulp and allied industries.

With the Elmendorf Tester standards for tearing strength are now established in the various industries which enable manufacturers to produce materials that meet the specified strength standards and which enable dealers and consumers to check the strength of materials so they can meet marketing competition.

The Elmendorf Tester is used to test a large variety of materials such as commercial papers, sand papers, insulating papers, fabrikoid, Tontine, cloth tape, etc.

TWO IN ONE FEATURE:—For testing gasket papers, roofing felts, floor coverings, fibre, liner board, etc., the Elmendorf Tester is furnished with the Augmenting Attachment, which doubles its tearing capacity:—Making two instruments in one.

Whether you manufacture or use paper and fabrics the Elmendorf Tester gives indisputable evidence that proves the quality of your products.

338

THWING INSTRUMENT COMPANY
3341 Lancaster Ave., Philadelphia, U. S. A.

MISCO "C"

Misco alloys are made in three electric furnaces; one capable of melting as little as 250 pounds; another up to 10,000 pounds.

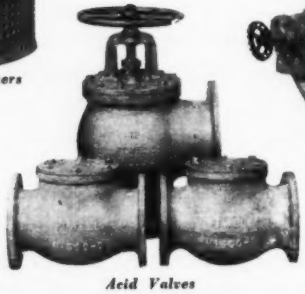
The corrosion resistant alloy

is proof against corrosion by sulphite liquor

Digester Neck Rings
Digester Bottom Sleeves

Fittings

Lite-Wate Strainers



Acid Valves

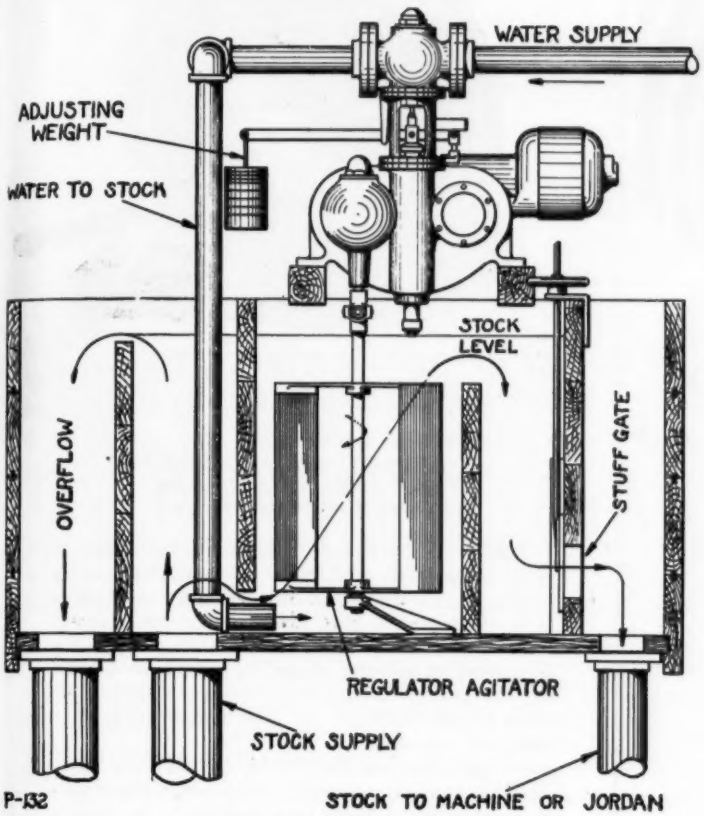
Top Laterals
Relief Valves

Acid Pumps

Bottom Crosses

MICHIGAN STEEL CASTING COMPANY
1990 GUOIN STREET, DETROIT, MICHIGAN

WHY — MEYERS-MESCO CONSISTENCY REGULATORS ?



Typical Installation

Because—

They are adaptable to any Operating Condition — any stock between 2.5 and 7 percent — any Volume — any Degree of Dilution —

They are easily installed—

Their maintenance is little or nothing—

They have but one point of adjustment—

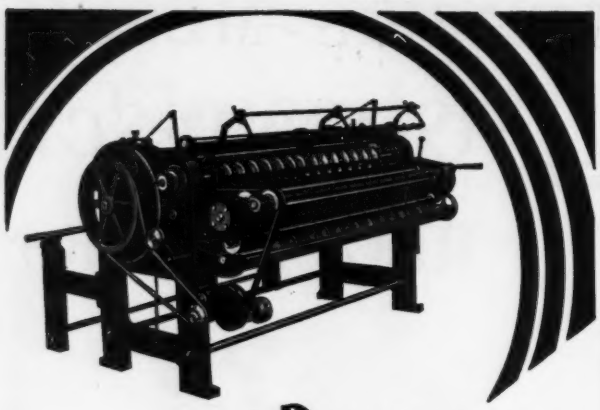
They consume little power—

They are accurate, dependable and rugged—

Meyers-Mesco Regulators **DO REGULATE**
and we will be glad to prove it by references or trial—

Write us for the facts.

MERRITT ENGINEERING & SALES CO., Lockport, N. Y.



All Ball-Bearing

ROLL TOILET WINDER

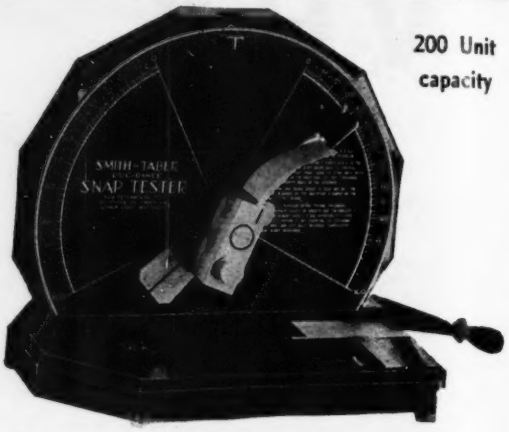
Guaranteed to operate at a speed from 800 to 1,000 feet per minute, this Three Spindle Rapid Toilet Rewinding Machine has the latest improvements. Made in any size up to 84" width, with or without automatic stop. Simple mechanism and sturdy construction to give the maximum production at a low operating cost. Frames are made very heavy to eliminate vibration; all rolls are counter-balanced. Jumbo rolls are controlled from the front to be in easy reach of the operator.

Before installing a rewinding machine, investigate this all-ball-bearing winder, one of the machines designed for economy in operation and years of satisfactory service.

PAPER CONVERTING MACHINE CO.
Green Bay Wisconsin

Designers and manufacturers of High Speed Rotary Folders for napkins, towels and toilet paper. Rotary printing presses for napkins, bags, envelopes, creping machines, bundling presses and special converting machinery.

"PAPER CONVERTING"
SPEED ROTARY PRINCIPLE SERVICE



200 Unit capacity

OF SPECIAL INTEREST TO MANUFACTURERS OF

INDEX BRISTOLS
TABULATING CARD STOCK
FIBRE AND PRESSBOARDS
FOLDER & COVER STOCKS

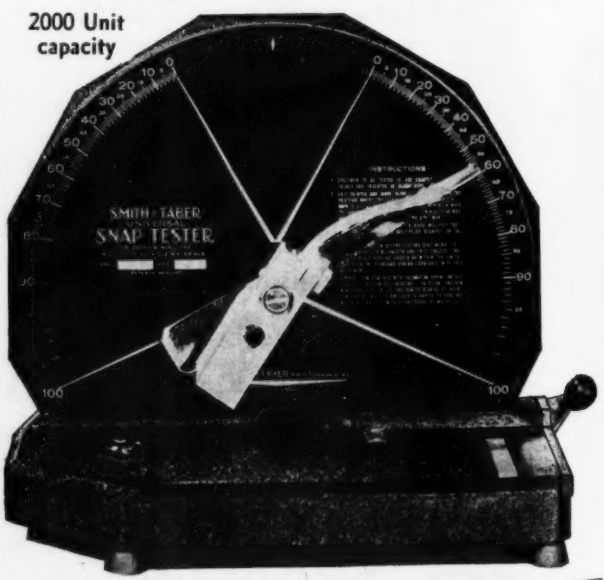
RIGIDITY is becoming increasingly important, as more often than realized, customers favor crisp, snappy papers over those that are soft and lifeless. It is, therefore, to your advantage to install intelligent control over this important feature—the first step being to provide recognized means for evaluating this quality. Snapping with fingers, rattling and other similar methods of determining stiffness or snap, are now obsolete.

Investigate the SMITH-TABER UNIVERSAL SNAP TESTER now! It accurately determines the rigidity of paper stocks, from thin onionskins to medium guage pressboards.

Write for illustrated circular.

SMITH-TABER · North Tonawanda, N. Y.

2000 Unit capacity



Here's our Answer

In the drive for profits this year, mills can not expect much help from higher prices,—hope lies in lower costs. *To superintendents looking for better equipment to cut manufacturing costs, here's our answer—*

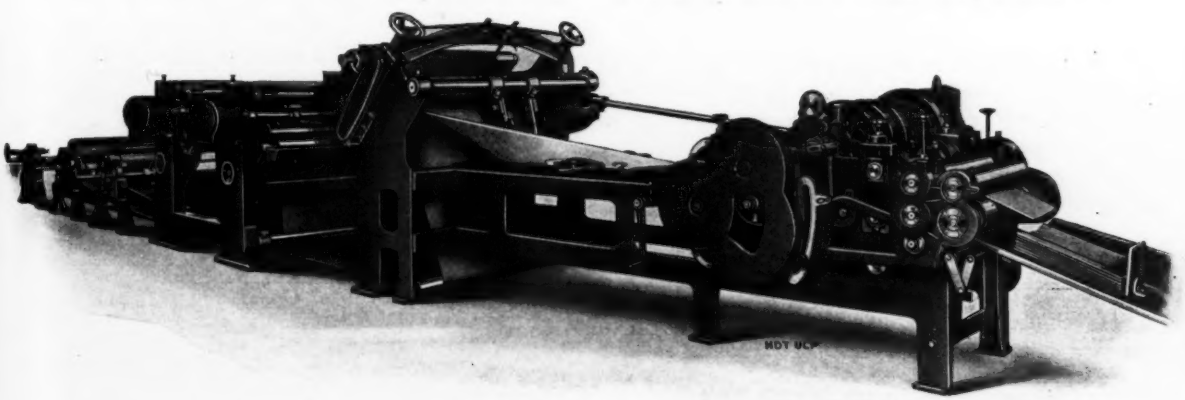
A NEW BAG MACHINE. S&W engineers have perfected and built a new straight line tuber for side seam bags. Speeds up to 800 ft. per min., electric eye control guarantees an even seam regardless of uneven or dished rolls, ease of setting and ability to vary the angle of paper to "former" shoes increases accuracy of fold and reduces waste. Length of bags from 9–44 inches, width of bags from 5½–14 inches. Send for the bulletin describing S&W paper bag making machinery.

MODERN FOURDRINIERS. The longest experience in the field building fine paper making machinery for high-grade papers. If you are planning to rebuild or add new equipment, call in an S&W engineer.

UNDERCUT TRIMMERS. S&W Undercut Trimmers are safe, fast and accurate. Dual Control keeps both hands below the table at the time of the cut. Send for descriptive bulletin.

A bulletin has been prepared which describes the complete line of Smith & Winchester paper mill, paper cutting and paper bag machinery and tells about the facilities and services available. Write today for a copy to: Smith & Winchester Mfg. Co., South Windham, Connecticut.

MAKERS: *Fourdriniers, cylinder and wet machines; paper bag machines; undercut trimmers; Rainstorm shower pipes; slitters and calenders; reels and winders; rolls (bronze and wood); Jordans and Jordan fillings; stuff and fan pumps; castings from our own or customers' patterns.*



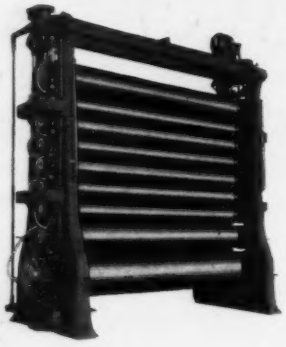
The SMITH & WINCHESTER *Manufacturing Company*

1828

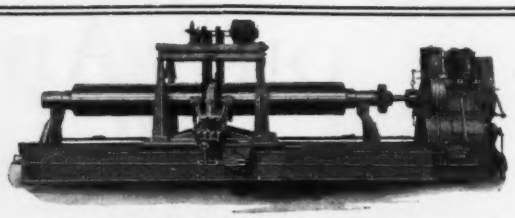
PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

565

Increase Efficiency with—



Lobdell Calender Stacks that are accurate and durable machines equipped with "floor controlled" Lifting Device, operated by Motor, Ratchet or Hydraulic Cylinder. Modern, Trouble-free lubrication is another feature of these widely used Calender Stacks.



The **Lobdell Roll Grinding Machine,** designed primarily for grinding paper mill rolls, the most efficient machine obtainable for this purpose.

Simplicity of design; Rigidity of wheel mounting; the automatic crowning device; provision for leveling the bed, and automatic lubrication,—make this superior efficiency possible.

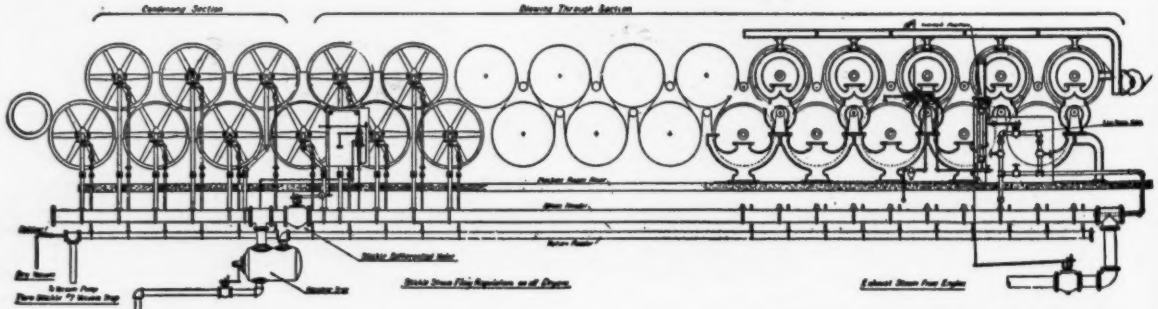
Lobdell "Puraloy" Chilled Rolls assuring maximum hardness and a perfect surface. They minimize pitting and wear, and are therefore ideal for the very severe conditions of water finish papers . . . an "exclusive" Lobdell Product.

LOBDELL
CAR WHEEL COMPANY
96 Years in Business
WILMINGTON·DELAWARE

Lobdell Micrometer Roll Caliper, an indispensable instrument for all mills,—to keep a check on re-grinding and on the condition of Calender and Press Rolls. Is light in weight, easily adjustable and extremely accurate.

...Send for Literature on any or all Products...

STICKLE'S SYSTEM OF DRYING PAPER



Back View Wet End of Machine Showing Stickle Compound Differential Rapid Circulating Drainage System

Front View Dry End of Machine Showing Stickle Automatic Steam Control

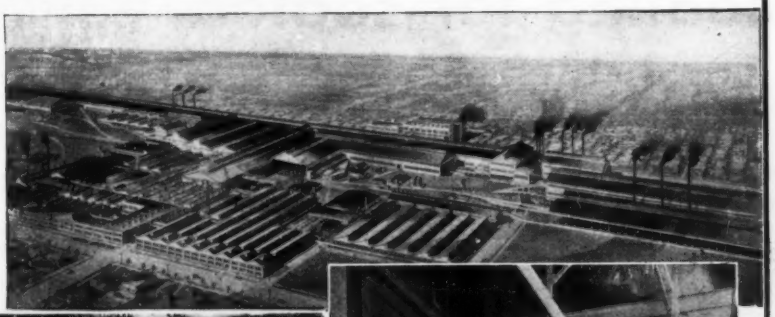
The Stickle Automatic Steam Control and Differential Rapid Circulating Drainage System will automatically maintain an evenly dried sheet at the lowest possible pressure at which a sheet of paper can be dried. The sheet will be held close to a one-half of one per cent moisture change.

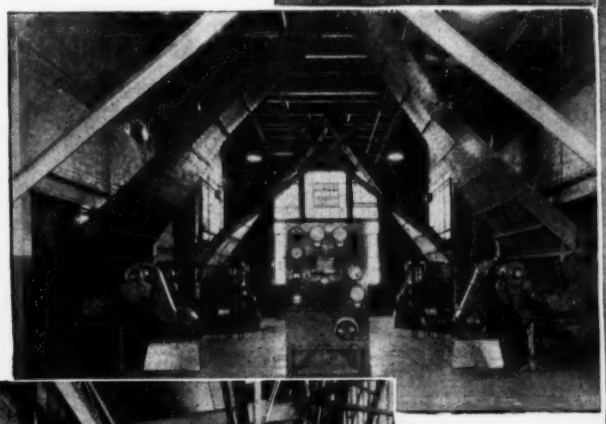
Ask for Bulletin No. 18

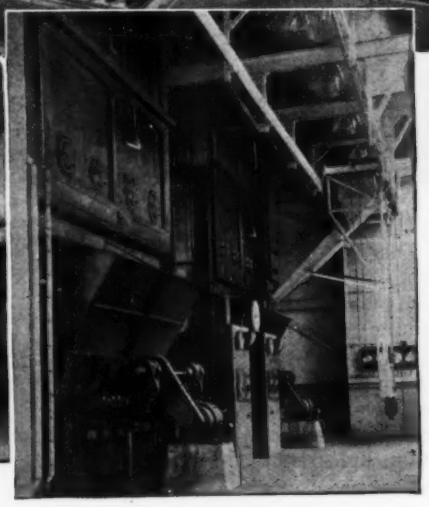
STICKLE STEAM SPECIALTIES CO.
NEW YORK INDIANAPOLIS, IND.

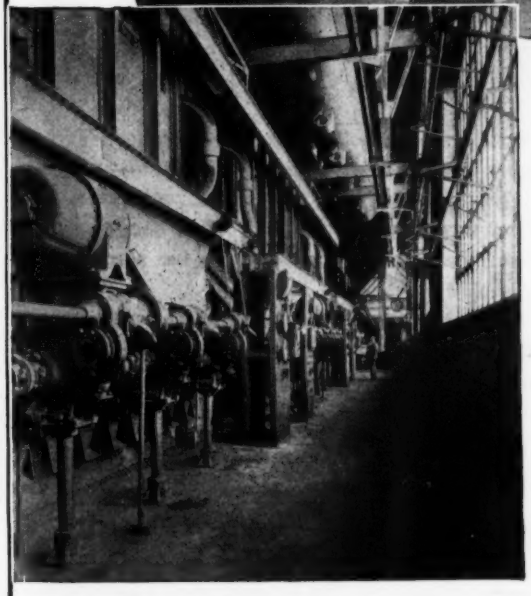
Taylor Stokers

Chosen by the Leaders









In the progressive industrial plants of the country . . . organizations that have won places among the leaders by the merit of their products and the efficiency of their management . . . you find the Taylor Stoker.

A few such typical plants are shown here. At the top are the works of the Timken Roller Bearing Company; in the center from left to right, are the Taylor Stoker installations in the boiler rooms of the Dodge Brothers Corporation and the Rhinelander Paper Company; below, is a view of a battery of Taylor Stokers in the power plant of the Columbia Chemical Company.

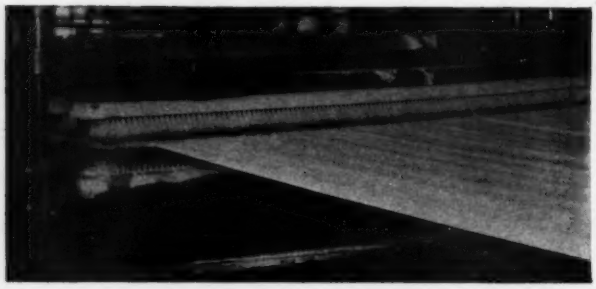
Examples such as these might be multiplied almost indefinitely. Taylor Stokers are serving every kind of industry that uses steam for power or heating. They are located in every manufacturing district where coal is burned.

Write for booklet "Burning coal the Modern Way". It will be of interest to every executive responsible for the economical production of steam.

AMERICAN ENGINEERING

AMERICAN ENGINEERING COMPANY, 2401 ARAMINGO AVENUE, PHILADELPHIA

"A smooth, even coating for coated stocks"



● That's what production men are saying about Titanox-B (barium base). This fine white pigment does not clog nor thicken in the machine because it has excellent mixing and dispersing qualities. It can be easily mixed with china clay, satin white or blanc fixe to produce stocks that are whiter and more opaque. • For making super and coated stocks of both light and medium weights, Titanox-B (barium base) produces better results because it offers these important properties: (1) high index of refraction; (2) remarkable brightness; (3) fine particle size; (4) chemical inertness; (5) high bulking value. • You'll also find that Titanox-B is uniform in color and particle size and free from objectionable foreign matter. Tests at all important steps of manufacture insure a product of highest purity and quality. • Let our research staff cooperate with you in improving your stocks. Write today for helpful information.

TITANIUM PIGMENT CO., INC.
Manufacturers of
TITANOX-B (Barium Base)
TITANOX-C (Calcium Base)
PURE TITANIUM OXIDE

111 Broadway, New York, N. Y.; Carondelet Station, St. Louis, Mo.; Pacific Coast Distributor: National Lead Co. of California, 2240 Twenty-fourth Street, San Francisco, California; Canadian Distributor: Wilson, Paterson, Gifford, Ltd., 101 Murray Street, Montreal—132 St. Helen's Avenue, Toronto, Ontario.

TITANOX

TRADE MARK REG. U.S. PAT. OFF. TITANOX

a Chain for Every Drive and Carry

In Malleable or Z-Metal

Detachable Pintle Griplock "H" Type
Wide Conveyor Roof-Top Unicast Roller Griplock Roller

Steel

Chabelco Roller Rex Roller Chain Draw Bench Cast Steel Drag

Combination

Steel: Z-Metal (or Malleable) Durobar Combination Ley Bushed

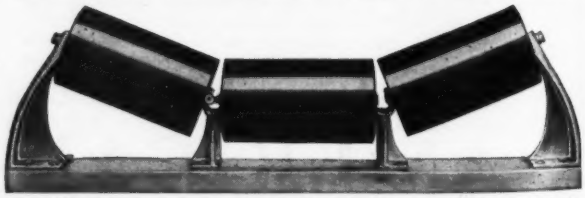
For driving any machine—on short centers or over considerable distances—for conveyors for carrying any material—the Chain Belt Company offers you a chain that fits the purpose and in many cases a wide range of selection in material, design, strength and price.

Chains with specialized advantages—Durobar—Griplock—Unicast—Chabelco—were originated by Chain Belt. Each solved a pressing drive or conveying problem. Each gave and will still give better service than the chain it supplants on the same sprocket wheel.

Now—again Chain Belt advances the art of driving and carrying by chain by making available for industry that marvelous new metal—Z-Metal in chain.

Complete information will be sent on request to anyone interested.

CHAIN BELT COMPANY
1605 WEST BRUCE STREET, MILWAUKEE, WIS.
CHAIN & BELT CONVEYING



Established 1891—Branches or Representatives in all Principal Cities

WHITE STAR RUBBER ROLLS

STONITE

PATENTED

STONITE is a ¾" covering of a new Controlled Mixture of hard rubber and quartz, multiplying the good points of a Granite roll and avoiding any danger of accident.

Above you see the surface mosaic of the materials in STONITE as the camera reveals it.

STONITE gives much less adhesion to the sheet than granite. This is because of the control of the materials used to create the ideal surface, and one which carries more water to the nip.

Brass Rolls with their smooth, slick surface carry no water and cause the sheet to adhere.

Apply these advantages of STONITE to your own problem.

If you have breaks on the first press, STONITE will give quick release and increased production.

This has been proven repeatedly on high-bulk book.

The mill trying for finish finds that STONITE makes the printer happy as it does not disturb the surface fibers. And as a smoothing roll it is helpful in removing wire marks.

You can avoid crushing by using STONITE on a light weight roll body, which gives a total weight much less than granite. One mill reports that with no other change the use of STONITE added 50% to the life of the first felt.

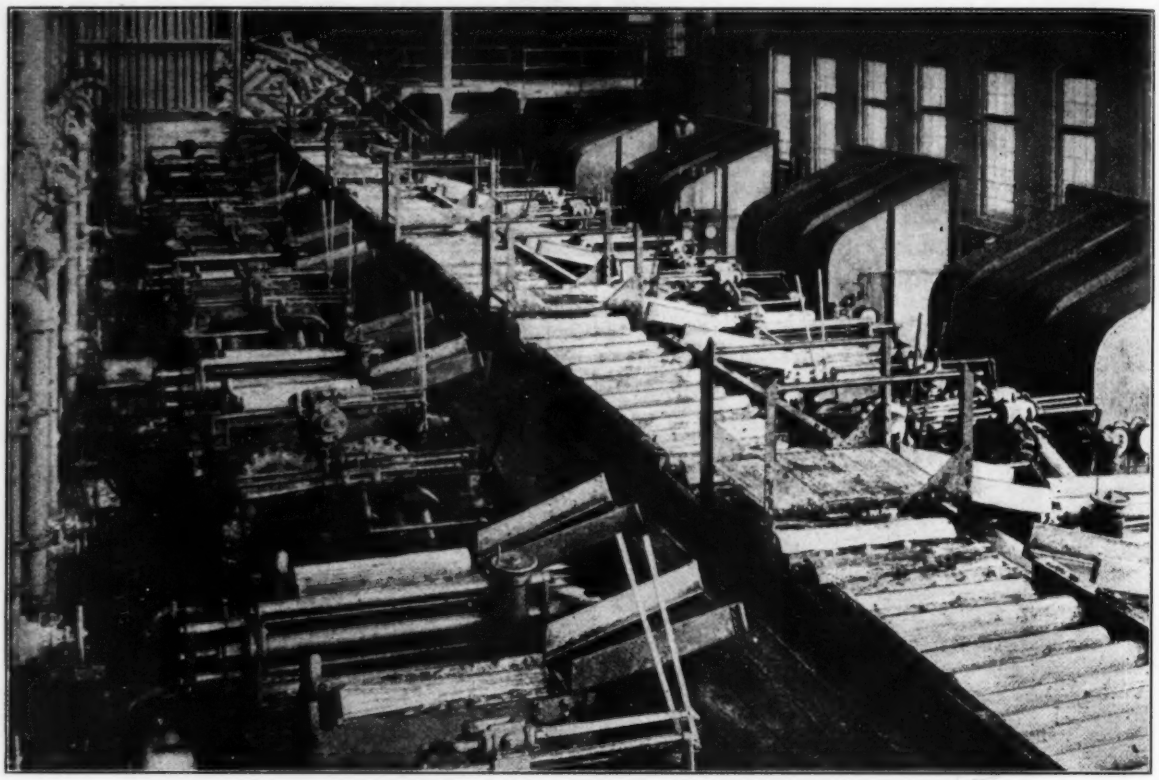
Whatever your needs may be, STONITE will meet them. Our experience covering the whole range of the industry is yours for the asking.

STOWE-WOODWARD, INC.

NEWTON UPPER FALLS, MASS.

The Great Northern Grinder

U. S. Patent No. 1757031



PARTIAL VIEW OF GRINDER ROOM CONTAINING 12 GREAT NORTHERN GRINDERS

POINTS OF OUTSTANDING ADVANTAGE

(1) PRODUCTION PER STONE—25 TONS AND UPWARD

The large effective grinding area and method of feeding wood to the stone assure high production.

The efficiency of the operator is automatically checked.

Hazards are eliminated insuring maximum freedom of operation and security to the operator.

(2) MODERATE COST OF INSTALLATION

Cost of grinders including installation is relatively low.

No overhead filling loft is necessary. Space occupied is less than for any other type of modern grinder, and where replacing 2 ft. grinders, existing building may be easily adapted to the new installation.

(3) LOW OPERATING AND MAINTENANCE CHARGES

Minimum operating costs are permitted by the high rate of production and by the ease of getting wood to the grinders.

The solid design and sturdy construction insure low maintenance costs.

New stones can be easily installed.

(4) DESIGN OF GRINDER ADAPTED FOR POSITIVE CONTROL OF QUALITY

The surface of the stone is easily inspected and accessible for adjustment.

Wood approaching the grinders is always in view for inspection, and wood is delivered to the grinder by a water conveyor, loose dirt and bark being removed in conveyor.

Automatic temperature controls are easily installed.

(5) WATER CONVEYOR AND VENTILATION

The water conveying of wood direct to the grinder contributes to a minimum of labor, power consumption, and maintenance expenses. It also is a vital factor in obtaining best quality.

Working conditions are healthy; the method of ventilating the grinder eliminating fog in the room even in the coldest weather.

We should welcome the opportunity of making, without obligation on your part, a study of your grinder problems.

MONTAGUE MACHINE CO.

Turners Falls, Mass.

Just What is a "Low Carbon" *Alloy Steel?*

The answer is important in the purchase of castings for sulphite mills

"Low Carbon" is a term often applied rather loosely to alloy steels.

Alloy steel castings produced by The Duriron Company have a carbon content ranging from .04% to .07%. Any alloy steel testing above .09% we do not consider as *low carbon*.

Regardless of the percentage of metal used in the alloy, low carbon is still necessary to completely resist intercrystalline corrosion. Total carbon above .09% results in a weakening of the physical structure when the casting is exposed to sulphite liquors.

Absolute control of the carbon content can only come from methods and equipment that have been developed through years of experience and experimentation.

That is the secret of the success which sulphite mills are having with relief valves, strainers, test cocks, digester fittings and similar equipment supplied by us.

Maximum resistance to sulphite corrosion, homogeneity and machineability are qualities that you can depend upon in Duriron's Durco loosely to alloy steels.

IF YOU WANT INFORMATION

If you have a corrosion problem, or if you want information concerning alloy steel castings of standard or special design, write us. We are organized to be of service to you.

THE DURIRON COMPANY, INC.
444 N. Findlay St. Dayton, Ohio

DURIRON

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTY-FIRST YEAR

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President. J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 15 West 47th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1933, by the Lockwood Trade Journal Co., Inc.

Fine Paper Market Conditions During 1932... 21
Capacity and Actual Production of Paper Machines in the United States ... 22
Improve Minisink Paper Mills ... 22
Paper Board Industry Review for 1932 ... 23
Finnish Paper Shipments Increase ... 26
Book Paper Mills Anticipate Better Conditions 27
Production of News, Uncoated Book and Writing ... 27
Great Northern Paper Co. Report ... 28
Appeal for Deposits of Celotex Issue ... 28
Soviet Added Four Paper Machines ... 28
R. J. Rock Heads Mutual Box Board Co. ... 28
Wood Pulp Industry Experiences Troubled Year ... 29
Production of Bleached and Unbleached Sulphite ... 30
Production of Bleached and Unbleached Sulphate ... 30
Paper Stock Industry Has Trying Year ... 31
Chemical Industry Affected by Depression .. 32
Total U. S. Wrapping Paper Production 32
U. S. Kraft Paper Production ... 32
Canada's Paper Industry Has Stormy Year .. 33
Rushmore Mills Start Production ... 35
China To Build Government Paper Mill 35
Paper Men Hold Annual Meetings in New York ... 37

Technical Section

Progress in the Production and Transmission of Heat and Power ... 59
Steam Generation ... 59
Steam Distribution ... 91
Steam Power ... 91
Hydraulic Power ... 95
Generation of Electricity ... 101
Distribution of Electricity ... 101
Plan and Design of Power Plant and Distribution System ... 107

Editorial ... 114
The Year in Paper ... 114
Scott Paper Co. Makes Good Report ... 115
Rolland Paper Co.'s Earnings ... 115
Northern New York Mills Favor Tariff 115
Lease Mt. Vernon Straw Board Co. ... 115

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 118-119

Established 1886

FUTUREOCRACY

The democracy has survived the greatest period of contraction in history. It is now the duty of constructive leadership to assume responsibility for accelerating the forces of reconstruction now operating.

The period of stability established during 1932 brings new hope of a returning confidence in America and its institutions. While there are readjustments still to be made, a hopeful view of the future for a sustained recovery in business is fully justified.

Our facilities and experience covering nearly half a century of service devoted to the pulp and paper industry are cheerfully placed at the disposal of the American Papermakers in the solution of their problems.

WOOD PULP

Of Every Description

HEAVY CHEMICALS

GOTTESMAN & COMPANY

—Incorporated—

CENTRAL NATIONAL BANK BUILDING

Broadway at 40th Street

New York, N. Y.

European Offices:
Birger Jarlsgatan 10
Stockholm, Sweden.

ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

Vol. XCVI, No. 7 PAPER Thursday, February 16, 1933

Fine Paper Market Conditions During 1932

Further Decline In Volume of Business Experienced In Writing Paper Section — Production Schedule Closely In Line With Rate of Operations for Related Consuming Industries— Marked Decline Experienced In Output of Cover Paper—Shifting of Grades

By E. H. Naylor, Sec.-Treas., Writing and Cover Paper Mfrs. Association

THE third year of the depression brought to the writing paper industry as it did to all other industries a further decline in the volume of business. For 1932, production averaged 58 per cent of normal and shipments 59 per cent, representing 15 per cent and 16 per cent declines respectively from the 1931 average.

In cover paper the decline was more marked, 1932 production averaging 37 per cent of normal and shipments 40 per cent, representing 36 per cent and 38 per cent declines respectively from the 1931 average.

The 1932 rate of operations for writing paper was considerably above the rate of production for such heavy industries as iron and steel, cement and construction, but closely in line with the rate of operations for consumption industries, to which the fine paper business is definitely related.

There has been more liquidation in writing paper than many people seem to realize. In 1925, writing paper prices had declined 35 per cent from the 1920 peak. In 1929—during the height of the boom—they were down 38 per cent from the 1920 peak, whereas today, they have been liquidated 46 per cent below the 1920 level.

The business outlook for 1933 is not too promising. At best it will be a difficult year in which we shall make progress slowly. Conditions may be somewhat better than in 1932, if we are correct in expecting a better understanding of the difficult economic problems which are confronting us.

While our domestic situation is fundamentally set for improvement, America is faced with a gigantic problem of assuming leadership in correcting international economic difficulties. No real business recovery is possible until the international financial relationship passes through its present acute stage.

New Machines

Paper production in 1932 was about equal to the volume of 1923, but in relation to capacity it was the lowest on record.

Reports received from all paper-making machinery manufacturers indicate that six new machines with a daily capacity of 181 tons were installed in the United States during 1932. This is by far the smallest number of machines and the smallest capacity installed in the last thirteen years, since we have been compiling these figures.

Of the six machines installed, the most important was a 246-inch book machine having a daily capacity of 150 tons. The other five machines would be classified as specialty machines. Three of them, each having a daily capacity of three tons, are producing wadding. One small 32-inch machine is being used in the south for experimental work in connection with the possible production of white papers from pine. The sixth machine is 100 inch, rated at 20 tons per day for the production of art papers.

The capacity at the end of 1931 was estimated at 14,000,000 tons. The 1932 additions do not materially change the capacity of the industry, which is now listed at 14,050,000 tons. The estimated production of 7,900,000 tons for 1932 indicates operation at 56 per cent of capacity as compared with 67 per cent of capacity in 1931, and 73 per cent of capacity in 1930.

It is generally recognized that many of the paper machines installed in the United States were not projected to fill any urgent need or demand for the paper. They were installed in connection with pulp mills where it was found impossible or unprofitable to dispose of the pulp output. It was felt that the only way out was through paper machines, but experience in many instances has shown this reasoning to be of doubtful value.

There has been some talk of the eventual building of paper machines on the Pacific Coast to take up the vast increase in pulp production which those mills have not found possible to dispose of in eastern or central markets. Such a possibility is hardly to be expected under present conditions but it remains a factor to be reckoned with in the future.

Shifting of Manufacture

The industry continues to be disturbed by the shifting of manufacturers from one grade to another, resulting in intensified competition with gains to no one. This is a difficult problem that cannot be dismissed lightly. The growing difficulties of the news print producers, northern kraft mills, etc., are bringing about a certain shifting of grades which requires more than ever complete organization of all producers.

Failure of some branches of the industry to have com-

plete information as well as confidence in their competitors, resulted in a delay in recognizing the necessity for adjusting production to demand. Individual manufacturers seemed to have in mind that a high rate of production would bring lower costs, and when all met in a limited market, prices simply went to smash.

Many in the industry learned, at a terrible cost, that lower prices did not bring additional business, but merely lowered prices for the entire group. The old idea that the greater the production, the lower the cost, is only half true. Each individual must consider himself a part of the picture as a whole.

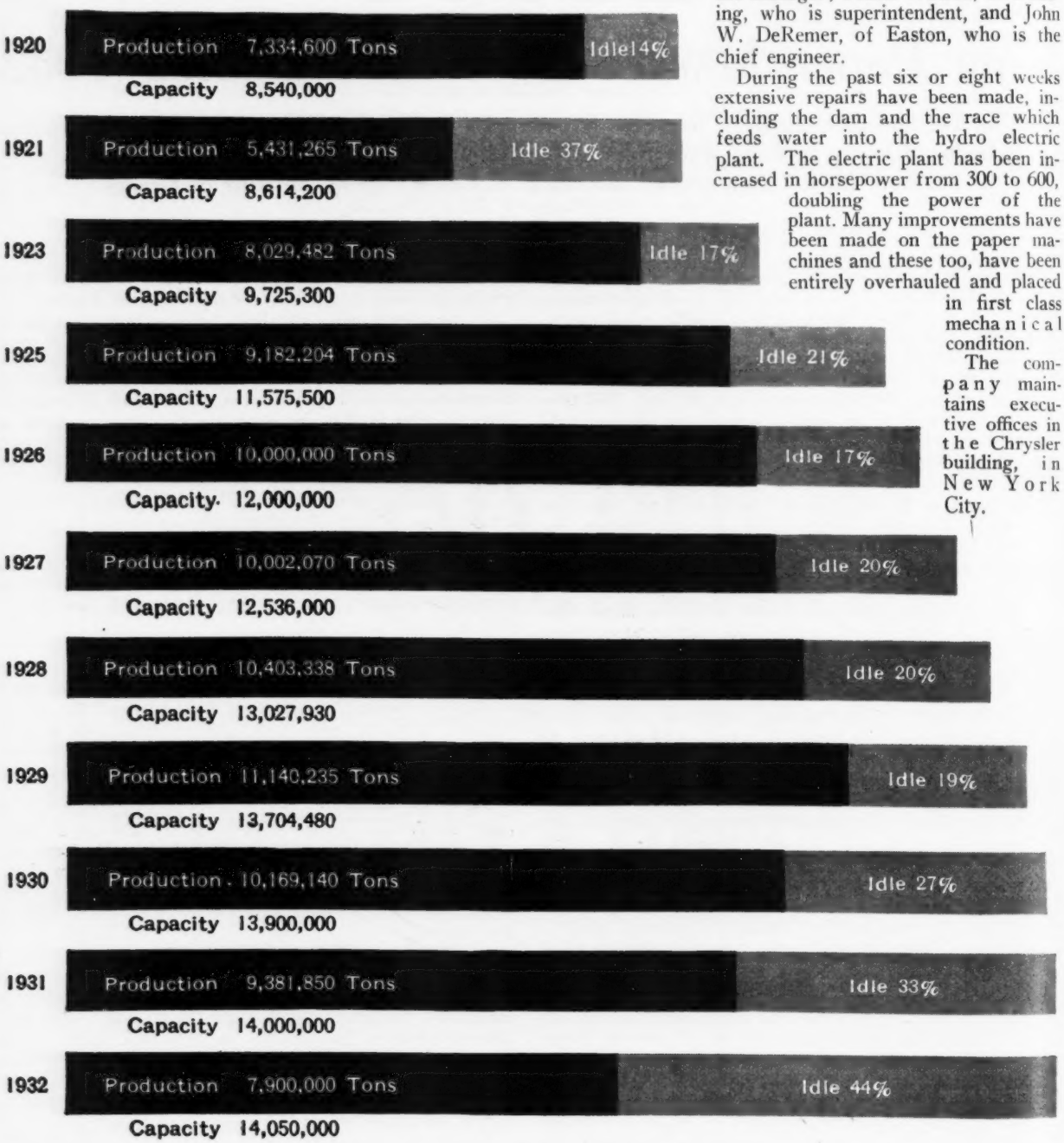
Improve Minisink Paper Mills

Many improvements have been made at the newly organized Minisink Paper Mills, Pa., formerly the Analomink Paper Mill, at Minisink Hills, according to announcements made at the office of the company, and these will continue to be made until the plant will be running at a full force of nearly 100 men.

The new company is headed by G. F. Shampanore, of New York and Delaware Water Gap, who has had many improvements and changes made in the plant. The plant is now in charge of Burt N. Transue, of Portland, who is the manager; Frank Watson, of Reading, who is superintendent, and John W. DeRemer, of Easton, who is the chief engineer.

During the past six or eight weeks extensive repairs have been made, including the dam and the race which feeds water into the hydro electric plant. The electric plant has been increased in horsepower from 300 to 600, doubling the power of the plant. Many improvements have been made on the paper machines and these too, have been entirely overhauled and placed in first class mechanical condition.

The company maintains executive offices in the Chrysler building, in New York City.



CAPACITY AND ACTUAL PRODUCTION OF PAPER MACHINES IN THE UNITED STATES.

Paper Board Industry Review for 1932

By Grafton Whiting, Statistician, Paper Board Industries Association

PAPER BOARD as the name implies is a board composed of the same ingredients as found in paper but thicker and heavier to suit the purpose for which it is used. The point of distinction between paper and board is not clearly marked but custom has dictated that a thickness less than 12/1000 of an inch is considered paper and over that figure is board.

Two general types of machines are employed—the Fourdrinier making a homogeneous sheet and the Multi Cylinder machine producing a laminated or ply sheet. Paper is made for the most part on the Fourdrinier or single cylinder machine whereas board is produced on both types of equipment. It is because of this and the fact that many grades of paper draw upon the same sources of supply for their raw materials as do the board products that conditions in one branch of the industry affect the others.

This has been true during 1932. The reduced demand for paper has induced mills seeking a sufficient complement of orders to invade the board fields and the shifting from one class of product to another has brought confusion first in one section and then in another, with the feeling of resentment and retaliation playing a prominent part.

In 1931 paper mills, excluding newsprint, operated at 64 per cent of rated capacity, while in 1932 the showing was 52 per cent. Paper board mills had an average of 63.4 per cent in 1931 and 55 per cent for 1932. It is of interest to note that in the face of some invasion by mills not customarily classified as board producers the activity of the board industry has held its position better than did the paper mills.

The paper board industry is divided into four major groups, namely: Box board mills—producing box board and similar types of heavy fiber board; Container plants—manufacturing shipping cases and packing materials; Folding box makers—supplying collapsible cartons and display packages; Set-up box plants—fabricating rigid paper board boxes. The first three of these groups are represented by the Paper Board Industries Association, and the following review treats chiefly of their experience during 1932.

The demand for the mills' product, when reviewed over the past ten years, shows an annual increase in excess of 5 per cent. In 1930 due to business conditions the situation changed and a loss of volume confronted the industry. This was repeated in 1931 and 1932 with a shrinkage each year below the previous totals. The capacity to produce on the other hand has steadily grown; first, through the installation of new machines and, secondly, by the increased speed and productivity of the existing equipment.

The capacity and growth is shown in the following table:

MILL CAPACITY (a)
Tons Per Day

	1927	1928	1929	1930	1931	1932
Rated tons	13,764	14,826	15,682	16,439	17,204	17,702
Tons added	.....	1,062	856	757	765	498
Per cent gain	.....	7.7	5.8	4.8	4.7	2.9

(a) The daily rated tonnage for all mills known to produce box board was taken from Lockwood's Directory (Lockwood Trade Journal of New York City) for each year 1927-1932.

The measurement of speed or mill efficiency can be stated by dividing the tons made by the machine hours taken to produce them. Assuming the average machine to be 100 inches wide the following is a comparison of performance.

AVERAGE TONS PER MACHINE HOUR

	1926	1927	1928	1929	1930	1931	1932
Tons per hour	2,643	2,739	2,964	2,984	3,019	3,100	3,000

The gain in 1929 over 1928 was 40 lbs. per hour; in 1929-1930, 70 lbs., and in 1930-1931, 182 lbs.; all of which is the equivalent to increased capacity. However, in 1932 there was a decrease of 200 lbs. from 1931. This change was due to the reduction in demand, which lessened the urge for maximum speed. Furthermore smaller orders were received requiring more frequent changes and consequent loss in productive time. On the other hand the average weight per M square feet of board produced was less and since fabricators compute their finished product on an area basis the ability of the mills to supply their wants is greater by the extent to which the board is lightened.

The demand for box board dictates the volume of work to be done by the mills and if contrasted with the capacity may be expressed in percentage which in turn is the activity of the industry.

The accompanying table contrasts the capacity and production for the past six years, and states the percentage of activity for each.

BOX BOARD MILL ACTIVITY
1,000 of Tons ("000" Omitted)

	1927	1928	1929	1930	1931	1932
Capacity (a)	4,129	4,448	4,705	4,932	5,161	5,310
Production	2,995	3,368	3,580	3,372	3,221	2,900 E
Per cent active	73	75	76	68	64	55

(a) The daily capacity is multiplied by 300 days to give the yearly total. E = Estimated.

During 1932 there were no new mills added to the industry and the increase in capacity was due to improvements in equipment and greater plant efficiency. On the other hand the number of mills forced into idleness increased in 1932 as shown in the following table.

MILLS IDLE *

Mills	1929	1930	1931	1932	1933
Paper mills—all grades	56	62	70	88	103
Paper board mills	7	9	13	17	21

* Analysis made from publications of Lockwood's Directory for the issues 1929-1933.

Idle mills are not deducted in stating the capacity figure since they are potential producers capable of operation should the demand warrant.

Orders—Production

The tonnage which the machine (or machines) in a mill is able to produce is termed "rated capacity." If the incoming orders and the production are divided by the rated capacity an expression for each can be had in percentages. Chart 1 is a composite of reporting mills showing these two sets of percentages monthly from 1930 to 1932 inclusive. The broken line on the chart represents incoming orders and the solid line production.

When orders are in excess of production the intervening space is left white and where orders overtake production the area is black.

For the most part during the past three years the rate of production has been greater than incoming orders. Starting with a bank of orders in January, 1930, equivalent to 9½ days at capacity running, the tonnage ahead of the machines at the close of 1932 has been reduced to less than 3.2 days. Customer demand for quick delivery and the urge to maintain the production schedules has brought this about, but it is an uneconomical condition calling for repeated changes with short runs on the machines, and making difficult a proper sequence in the operating program.

Seasonal Variations

The output of the box board mill is dependent upon the

demand of the box makers, and their requirements in turn are based upon needs of their customers in the use of boxes for outward shipments. This sequence of demand results in a certain seasonal variation in the volume of orders received by the mills conforming with the shippers' activity, but anticipating it by the time customarily required to make the board and fabricate it into boxes.

In the box industry each order is made to customer's specifications and there is little or no opportunity for building up a stock ahead to tide over the periods of inactivity. The seasonal variations averaged for five years and the experience during 1932 are illustrated on the accompanying chart.

It will be noted that the trends for the paper board are about one month in advance of the container and folding box plants.

Box Board Prices

During the last half of 1927 box board prices began a decline which has continued irregularly to the present time. The price levels and the extent of the change is shown for the four principal grades of board from 1927 to 1932 inclusive. A simple average is made at the bottom of the table to indicate the trend of the movement, and the amount of the gain or loss over the previous year is entered on the last line.

BOX BOARD PRICES PER TON

	1927	1928	1929	1930	1931	1932
Test liners	$65.00	$57.50	$51.50	$40.50	$33.50	$28.50
Chip .016 (rolls)	45.00	42.50	39.50	32.50	26.00	24.50
Single manila lined chip	55.00	52.50	47.00	42.00	35.00	36.00
News board No. 80 or heavier	45.00	41.50	37.50	33.50	27.00	28.00
Average	52.50	48.50	43.90	37.10	30.20	29.20
Average gain or loss	....	—4.00	—4.00	—6.80	—6.90	—1.00

From 1927 to 1931 the drop in prices was over 40 per cent, the greater portion of which occurred in 1930 and 1931. The loss in 1932 averaged but $1.00 and shows that the liquidation in box board is nearly complete. In fact a slight strengthening of the market was observed during the closing months of the year.

Container Plants

Shipping containers are of two types, corrugated and solid fiber. The first process in the container plant is the building up of the box blank sheet from board supplied by the mills. The operations in making a corrugated sheet consist of combining by means of a strong adhesive a corrugated or fluted middle section with an outer and inner liner. The solid fiber box blank is likewise made from box board but is built up by pasting successive plies together to form a laminated board varying in thickness from 60 to 100 points (thousandths of an inch). The box making operations which follow, cut and score the box blank into sizes and dimensions specified by the customer to accommodate the particular article to be shipped.

Both types of boxes serve the same trade for the most part; but while some find better protection in transit in one than in the other, competitive prices often dictate the buyer's choice.

Production

The tons of box boards fabricated into boxes from 1927 to 1931, and the estimated amount for 1932 (final figure not yet available) are shown in the accompanying table. A division is made between corrugated and solid fiber and the total gain or loss each year over the preceding period is expressed in percentage.

CONTAINER PLANT TONNAGE

	1927	1928	1929	1930	1931	1932 E
Corrugated	1,025,300	1,133,300	1,281,000	1,179,200	1,172,200	1,148,000
Solid	666,300	704,000	729,900	683,400	635,800	532,000
Total	1,691,600	1,837,300	2,010,900	1,862,600	1,808,000	1,680
Per cent	+5.4	+8.6	+9.4	—7.4	—3.0	—7.0

E = Estimated.

It will be seen that consistent gains occurred until 1930 when adverse business conditions not only cancelled the normal growth but carried the total 7 per cent below 1929. In 1931 a further loss of 3 per cent was had and in 1932 another loss of approximately 7 per cent occurred.

The expression "tons of boxes" is an unsatisfactory gauge of container production since the area of the box blank is the chief factor in measuring the output of the plant. Unfortunately, accurate statistics of area are not available, but it is known that the average weight per square foot has decreased steadily during the past three years. If the weight basis were taken into consideration the total output in area would be above 1927 but below that of 1928.

Seasonal Variation

As stated above, the demand throughout the industry has distinct seasonal trends, and for the container division Chart 2 shows a five-year average and the experience during 1932. The level of activity was distinctly below the

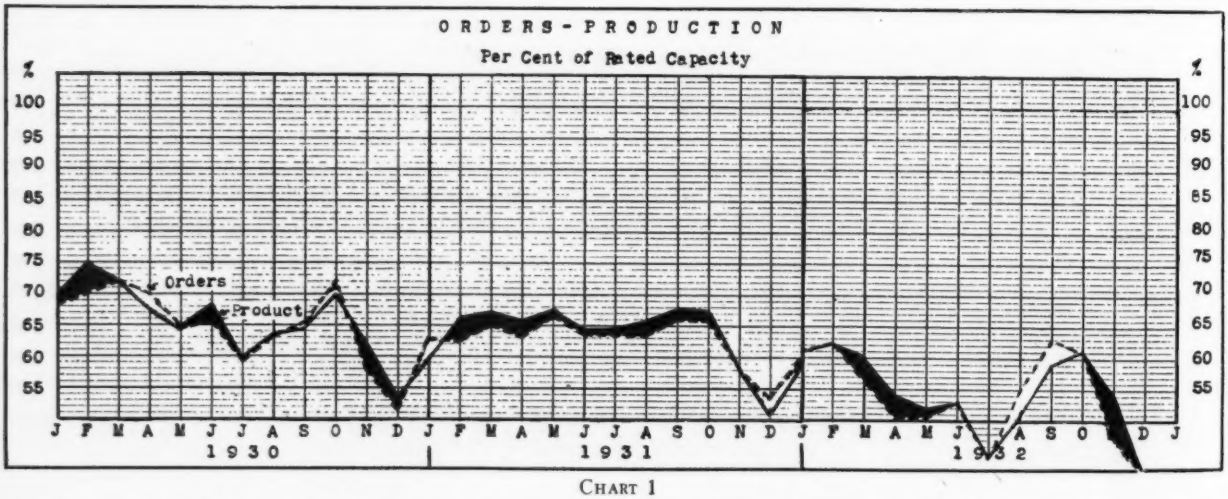


CHART 1

The actual order and production are each divided by the rated capacity to procure an expression in percentage. The two series of monthly figures are drawn on the same chart and where orders exceed production the intervening space is left white. The reverse position is indicated by the black areas.

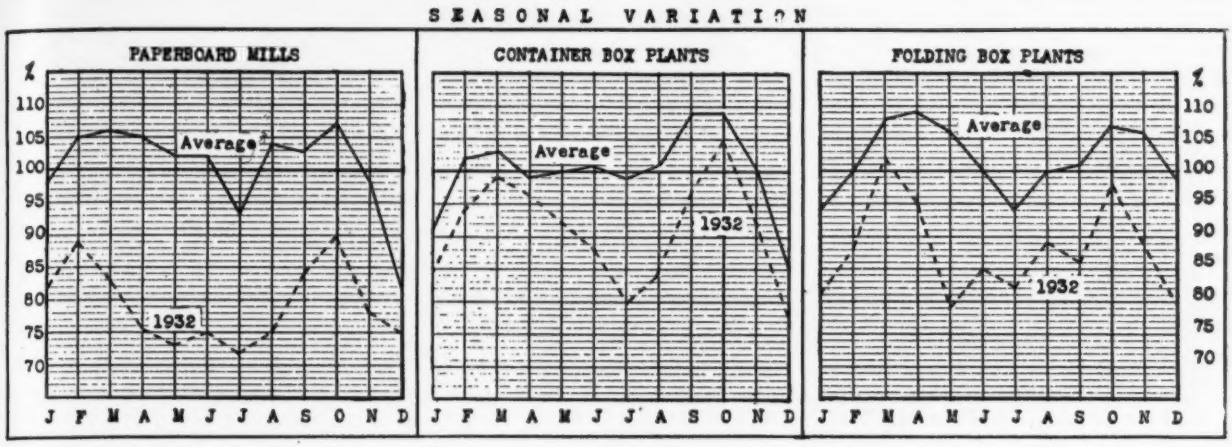


CHART 2

The operating time for a period of 5 years is consolidated by months and expressed as a percentage above or below the average. This is the solid line drawn on the chart. The actual running time for 1932 is treated in like manner and is shown by a broken line.

average expectancy but followed the seasonal variation except during the summer months when activity dropped to its lowest level and responded but slowly to the usual fall demand.

Container Plant Activity

The operating time contrasted with full time running is reduced to a percentage and shown on Chart 3 for both corrugated and solid fiber box fabrication. The yearly average performance is as follows:

CONTAINER PLANT PER CENT OF RUNNING TIME

Kinds	1930	1931	1932
Corrugated	75%	77%	71%
Solid fiber	67	64	59

The activity of corrugated and solid fiber hold much the same relationship throughout the year with solid fiber consistently below the corrugated level.

Container Prices

A statement of price levels is difficult to obtain in the container industry because of the variation in size and quantities of the order for boxes as placed with the fabricators. An average price per ton of finished product is not a good measuring stick but unfortunately is the only one available. Chart 4 is made from monthly reports received from identical companies covering the total tons shipped and the price at which sold. Dividing the price by the tons gives the average which is the basis for the chart line "Container Sales Price." By reviewing the past five years the overall average is found and by using this figure to equal 100 per cent the monthly variation is computed.

In a similar manner the market price of the principal raw materials entering into the product are averaged over the five years and the monthly change reduced to a percentage. This line is super-imposed upon the sales price to show the relative changes. Container plants have suffered a price decline growing successively worse over the past five years and the mills supplying the raw materials have had the same experience with an even sharper falling off.

Folding Box Makers

The makers of folding boxes use the product of the box board mill as their raw material but their plant operation is quite different from that of the container manufacturer. The box board is first printed to special design with as many copies as can be placed conveniently on a large sheet.

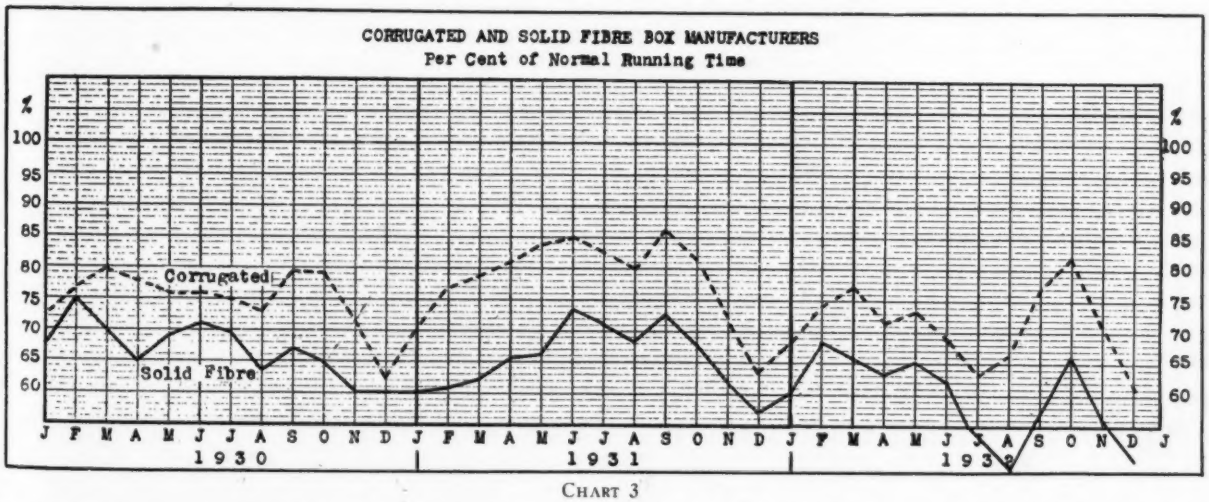


CHART 3

The normal or usual hours of operation per week for the corrugating machines are multiplied by the number of machines to give the possible machine hours. By dividing this rated figure into the actual hours operated, the per cent of normal running time is found. The records of the solid fiber pasting machines are treated in a similar manner, and the two are charted by months to indicate the variation in plant activity.

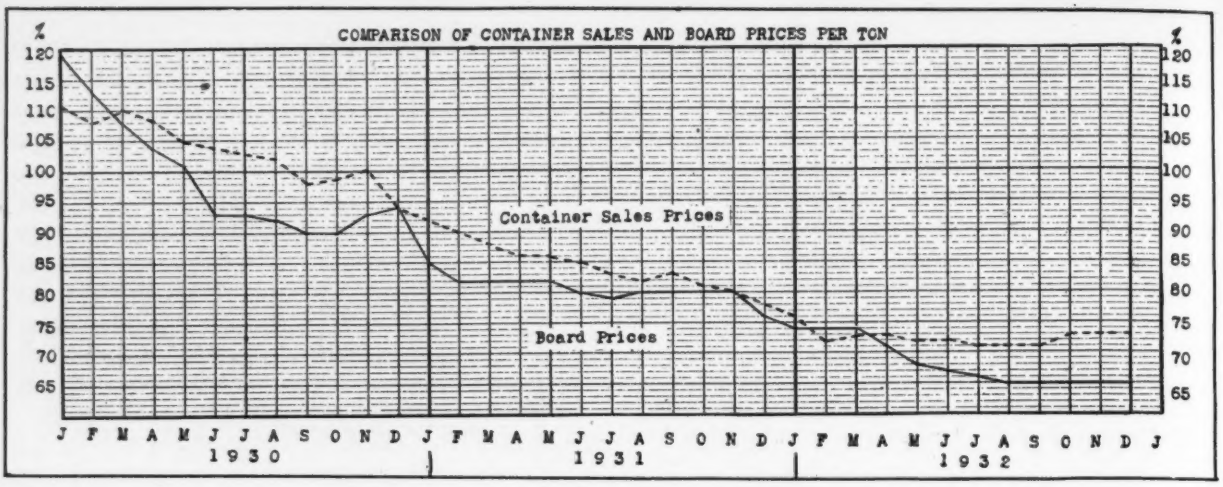


CHART 4

The total value of shipments of corrugated products is divided by the tons represented and stated in percentage of a 5 year average. The average market price of the raw materials entering into the product is weighted by the proportionate amount of each grade customarily used, and expressed as percentages comparable with the selling price. The relative fluctuations by months during the past three years is shown by plotting the two series of percentages on the same chart.

The next process is the cutting and creasing to separate the individual cartons, and from here they pass through the gluing machine where the edges are joined and the product is tied in bundles for shipment.

Because the folding carton is used for an individual article or unit pack it finds its way into the hands of the ultimate consumer, and attractiveness of design often is an item of sales appeal. In catering to this feature, ingenuity and artistic ability play a prominent part in the sales organization.

During the years 1930 and 1931 the loss in tonnage was 1 per cent and 3.7 per cent respectively. Complete figures for 1932 are not available as yet but reports from identical sources indicate that there was a loss of approximately 10 per cent.

Seasonal Activity

The periods of activity in the folding box industry vary in much the same manner as that of containers. The first quarter of the year, as will be seen by reference to Chart II, is more active than the last quarter; but in general the highs and lows are in conformity. During 1932 the operating ratio represented by the broken line remained below the five year average throughout the year, with the month of March the only time it approached near to the normal expectancy.

Folding Box Prices

The folding box makers have suffered from the price decline that has swept over the country but not to the extent that has been witnessed in the container division. The sales managers have been quick to realize that novelty in color and special treatment in the design of a package, if properly stressed, would place their customers in the position of accepting a service for which a fair price was justified. This applies, to be sure, on the smaller orders but it was a distinct aid in bettering the average price level. Orders open to competitive bidding have been placed at ridiculously low figures and no one in the industry is satisfied with the year's showing.

Outlook for 1933

The excess capacity in the mill group will be further augmented this year by the increased efficiency of the existing machinery. However, this does not mean an increased tonnage output because the number of orders is greater, with each calling for a lesser tonnage. This requires more frequent changes and a loss in the average tons per hour. The added cost of making small runs is rarely passed on to the customer in the form of increased sales price so the prospect for improvement in profits is far from encouraging. The action of the board market in the later part of 1932 indicates that the severity of the price cutting has run its course. If improvement in volume can be had there is some hope that the coming year will at least be equal to 1932. In the container and folding box fields some price improvement has been witnessed in certain sections of the country. This indicates that the folly of selling below cost is being realized by some and that volume gained by price reduction is too costly to be continued. Prices have been debased so thoroughly in all branches of the industry that it is safe to say that there are but two courses left to follow; a maintenance of the present level or a turn upward. This latter is dependent on an improvement in volume.

The consensus of opinions expressed at recent meetings indicates that the remainder of January will not see any increase in demand over the usual trend. February and March are given a somewhat better forecast to a point equal to the similar period in 1932. A few are more optimistic in the belief that as the spring demand develops, the depleted stocks of finished products must be built up and that boxboards of all kinds will be required for their packaging and shipment.

In making a forecast for 1933 it is considered probable that the first six months will equal the similar period in 1932 and the last half of the year will show a gradual but sustained improvement.

Finnish Paper Shipments Increase

Finnish paper shipments showed an increase for the first eleven months of last year amounting to 181,054 tons compared with a figure of 172,133 tons during the corresponding period of 1931 according to a report from Commercial Attache O. S. Watson at Helsingfors. The demand for news print increased in the latter part of the year but keen competition kept prices low. It is hoped that the agreement between Finnish and Scandinavian manufacturers of kraft paper will have the effect of stabilizing prices in that field, the report states.

Book Paper Mills Anticipate Better Conditions

Specially Written for the Annual Number of the Paper Trade Journal

IN line with all other industries, the book paper industry in 1932 suffered severely on account of the economic conditions, or "the depression" as has been experienced by the whole country since 1929.

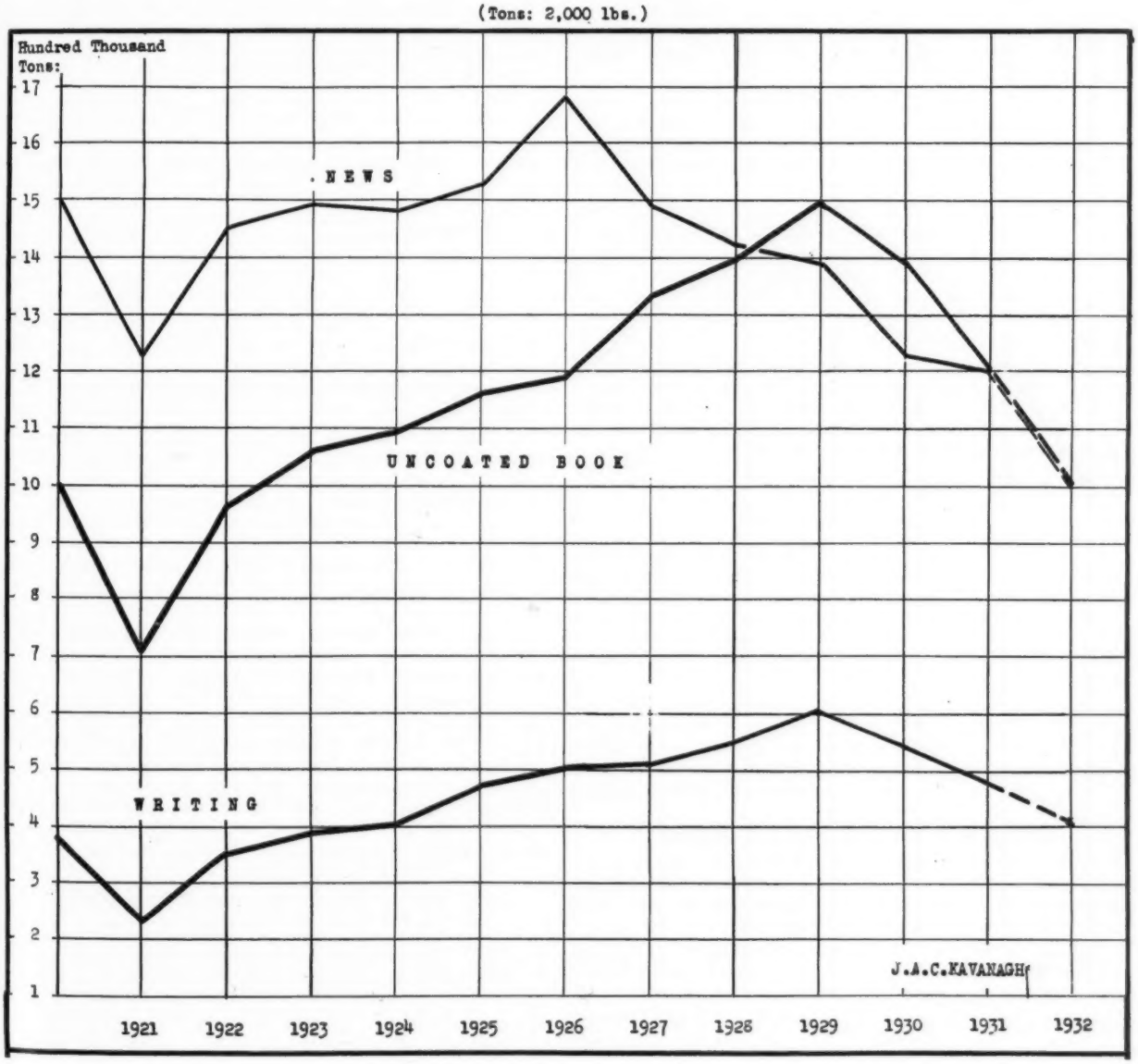
While the situation in 1930 and 1931 was decidedly off from normal, 1932 has no doubt been the most severe period up to this date. At the beginning of 1932, while mills were operating perhaps not more than 60 per cent, the decreased consumption of the various grades manufactured by book paper mills, kept sagging.

Throughout the year there has been a constant decline in prices, brought about by efforts of the manufacturers to increase their operations, which naturally meant constant and continued price cutting, which has no doubt reached the point where prices are being quoted today at cost, or even lower.

Book Paper Capacity Increased

The estimated capacity of the book paper mills for 1931 was 1,800,000 tons. The actual production during that period was 1,208,000 tons, or 67 per cent of the mills' capacity. In 1931 there were two new book paper machines installed and in 1932 there was but one installation, but this one machine was very large, which increased the capacity to 1,862,000 tons annually. In that period the actual production was 1,007,000 tons, or 54 per cent of the mills' capacity.

In the coated paper industry, there was no installation



of new coating machines; the capacity of the mills in 1932 remaining the same as in 1931, which was a total of 168,000 tons. In 1931 the production of coated paper was 115,000 tons, or 68 per cent of capacity. In 1932 the production was but 89,000 tons or 53 per cent of capacity.

Fortunately there is no indication of any new paper machines, or coating machines, to be installed during 1933.

The prices of coated book have suffered in the same way as prices on uncoated book; of course brought about by the same situation.

National advertising has fallen off very severely, which of course accounts for the falling off in the consumption of paper. The decrease in advertising has perhaps been more severe in magazine and trade publications than any other line, but the billboard advertising also suffered very severely, and on a whole, national advertising was perhaps not more than 25 or 30 per cent of what was enjoyed during the boom period up to 1929.

While the decline in prices of paper for publications has been very severe, it has been even more drastic in other lines of paper made by the book mills; such as, sulphite bond, tablet paper, envelope paper, etc., the prices on all of these grades having declined approximately 25 per cent from the market price the latter part of 1931 and beginning of 1932.

Sulphite Pulp Situation

A very important factor in the decline of prices in the products of book mills has been brought about by the large imports of sulphite pulp into this country from countries operating under depreciated currency.

This situation has reduced the cost of manufacture in these foreign countries approximately one-third, which has enabled them to sell sulphite pulp in the United States at a price considerably below the cost of manufacture of the American mills. This, in turn, has enabled the converting mills to lower prices on papers manufactured from sulphite pulp to a ridiculous figure.

The low cost of this raw material has unquestionably accentuated to a large degree, the very demoralized prices that have been existing during the past year. It has also enabled the increased importation of different grades of paper in the United States that came in direct competition with the papers made by the book mills; to say nothing of the news print manufacturers.

Outlook for Coming Year

It is hard to conceive how there can possibly be any further decline in prices, or in the consumption of the various grades of paper made by the book mills. The feeling seems to be general with the book paper manufacturers that the bottom has been touched and that the outlook for 1933 is for better, rather than worse, conditions.

There is no question, however, that a continuance for any great period of time, of conditions existing today in the industry, will mean the closing of a great many mills, or absolute failures, and the survival only of the mills in a strong position and able to weather the gale.

Great Northern Paper Co. Report

Balance sheet of Great Northern Paper Company as of December 31, 1932, shows total assets of $44,299,368 comparing with $47,233,675 on December 31, 1931 and surplus of $17,952,001 against $20,625,788. Current assets, including $4,441,416 cash and marketable securities, amounted to $14,283,772 and current liabilities were $545,367. This compares with cash and marketable securities of $3,159,051, current assets of $17,093,273 and liabilities of $587,137 on December 31, 1931. Capital stock consists of 998,330 shares, par $25.

Appeal for Deposits of Celotex Issues

Two protective committees for the holders, respectively, of the Celotex Company with paper mills at Marrero, La., and New Iberia, La., and general offices at 919 North Michigan Avenue, Chicago, $869,500 first-mortgage 6½ per cent convertible bonds, due on Dec. 1, 1939, and $1,700,000 convertible 6 per cent debentures due on Nov. 1, 1936, issued a joint statement yesterday asking the holders to deposit their holdings immediately. The company went into receivership in June, 1932.

The statement asserts that "during the last few months and since the appointment of receivers there has appeared in the insulating board field a product, the manufacture and distributing of which, in the opinion of the company's engineers and patent counsel, constitute an infringement of several of the company's important patents." It is further stated that the receivers have declared their intention to prosecute infringements vigorously, and to this end have advised the committees that they should have the organized support of the holders of the bonds and debentures.

The bondholders' committee is headed by Ralph Badger, senior vice president of the Union Guardian Trust Company of Detroit, and includes Mike S. Hart of the Real Estate Management, New Orleans, and James W. Marshall of Bacon, Whipple & Co., Chicago. The debenture holders committee comprises Harry S. Covington, executive vice president of the Guardian National Bank of Commerce, Detroit, chairman; E. J. Costigan, of Whitaker & Co., St. Louis; John F. Russell, Jr., of New York, and Henry Vardelin, secretary of the First Securities Corporation, Minneapolis.

The Union Guardian Trust Company of Detroit is depository for both committees, with Hovey C. Clark, 70 Broadway, New York, secretary for the debenture committee and Louis B. Warren, same address, as secretary for the bond committee.

Soviet Added Four Paper Machines

Four new paper machines were added to Soviet Russia's equipment in 1932 according to unofficial reports received here. The efficiency of the paper industry there, however, is disappointing even though its capacity is constantly being increased, the report says.

Managers of paper mills complain of shortage of labor, but do nothing to prevent the excessive turnover or the lax discipline. The average monthly productivity of labor in the paper industry fell to 85.9 per cent of the plan figure during the first half of last year and to 65.8 per cent during the third quarter. During the first nine months there were hired in the industry 16,654 men, while those that left were 16,846, the total number of men employed in the industry being only 19,959. Production costs paper during the nine months' period were 20 per cent higher than for the corresponding period in 1931, although the quality of the paper decreased materially. Only a year ago the government approved the standard of news print at 52 grams per square meter, yet domestic mills are now turning out a product of much greater weight, in some cases reaching 70 grams per square meter.

R. J. Rock Heads Mutual Box Board Co.

UTICA, N. Y., February 6, 1933—The annual meeting of the Mutual Box Board Company was held this week, at which Roger J. Rock was elected president. Other officers chosen included W. T. Baker as vice president and W. L. Roberts as secretary and treasurer. The board of directors named includes the officers, with O. W. Gridley and W. F. Roberts.

Wood Pulp Industry Experiences Troubled Year

By O. Frederick Swanson, Sales Manager, J. Andersen & Co., and the Pulp & Paper Trading Co.

THE trend of the wood pulp market of 1932 was rather easily followed throughout the year. This was largely due to the agreement between European pulp manufacturers to curtail production and to their efforts to stabilize prices and also to the statistical figures and excellent reports available at frequent intervals. For the purpose of improving conditions in the wood pulp industry, meetings were held at Malmo and Stockholm, Sweden, at which several leading concerns were represented. According to reports, the results of these conferences were beneficial to the entire industry. The European members of this agreement obligated themselves collectively to decrease the production of unbleached sulphite pulp by 25 per cent of the capacity tonnage determined for sale; at least 15 per cent of the decrease in production to be accomplished by July 1, 1933, and the remaining percentage during the second half of the year. It was also agreed that the members confine their sales exclusively through duly appointed agents. But in spite of the co-operation of the members, some old ailments of the industry persisted and, in some cases, in accentuated form and a few new ones were added.

Increased Financial Difficulties

Perhaps the most important of these newcomers were the increased financial difficulties of both buyers and sellers, delayed payments and subsequent decrease in earnings. An outstanding commendable feature of the year was the price situation, which remained practically on the same level throughout the entire year. The prices were unsatisfactory from the seller's point of view at the beginning and no change in this respect was noted at any time during the year. The maintenance of this unfavorable condition was due, at least to a great extent, to the poor demand, over-production and the extremely keen competition in the markets for products manufactured from wood pulp and not, as in preceding years, to any cut-throat competition in wood pulp itself. The strife, if it may be called such, between the so called self contained paper and board mills (mills making pulp also) and the so called converting paper and board mills (mills using imported pulp chiefly) was probably also in a measure responsible for the low prices on both imported and domestic wood pulp.

It was frequently inferred that the converting mills position was such that they could not exist unless they could procure their supply of imported wood pulp at sufficiently low prices to enable them to compete in their finished products with the products of the self contained mills. On the other hand, some of these mills appeared to be of the opinion that the converting mills were setting the pace in price cutting of products manufactured by both groups and that they were in a position to do so on account of the extremely low prices on the imported wood pulp used. As it would take a Solomon at least to render a just decision of this delicate question, I would not even attempt to express an opinion in the matter but might say that there must be some good points on both sides and if the business in general will only improve all minor obstacles will disappear automatically.

It would seem reasonable to assume that the economic suffering of unparalleled force and intensity, not only in the woodpulp but in other industries as well, has contributed in a rather generous measure to the general cause for the unfortunate condition of the woodpulp industry during the past year. There is an old saying "That there is nothing more timid than capital," but unfortunately most of us did not remember during our hey-days, that this quotation had ever existed. However, the "Helmsmen" on the ships with cargoes of this valuable commodity were also expert teachers and by the end of the year it had again became so universally known that almost all of us knew it.

Volume of Business Declines

At the end of 1931 it was hoped that the trade war of the world would soon be over and that reasonable prices on all commodities would again be obtainable. This, however, did not materialize during 1932 and instead of a relaxation there was a tendency towards regidity which gradually increased throughout the year so that by the end of 1932 there was some signs of a crisis in the woodpulp industry and, for that reason, the past year will probably go down in the history as the poorest on record. In addition to the extremely low prices on all kinds of wood pulp, domestic as well as imported, whether chemical or mechanical, the volume of the business transacted was considerably below any of several preceding years.

Buyers in general were not in a position to accept deliveries of the entire tonnage covered by contracts during the time stipulated, and as a consequence orders for new business were frequently coupled with reduced prices on unfilled tonnage and extended time of deliveries. The rather limited number of buyers fortunate enough to be so situated that their requirements could be covered with purchases in the open market, were often able to procure almost any kind of pulp at lower prices than at which similar grades could be obtained through the regular selling agents. Transactions of this kind consisted in most cases of pulp for resale and also of grades available through channels other than duly appointed selling agents.

Labor Conflict in Sweden

Aside from the rather serious labor conflict in Sweden, peace in this respect reigned throughout the world. The dispute in Sweden started in February, was extended into April and only concluded on August 7. As a result of this strike, the daily production of Swedish pulp was reduced by approximately 2,650 tons of sulphite pulp, 1,600 tons of kraft or sulphate pulp and about 2,000 of mechanical pulp. In spite of this rather formidable reduction, it had not the slightest effect on this market, at all events as far as prices were concerned. The poor demand and the agreement between the European pulp manufacturers to restrict production, particularly of chemical pulp counterbalanced the reduced tonnage caused by the strike.

The disillusion of the Scandinavian cartel had undoubtedly a detrimental effect on the price situation of mechanical wood pulp. This market was also decidedly quiet throughout the entire year and this together with prices the lowest ever, the market of this commodity approached a chaotic condition, but the outlook at the end of the year was a trifle brighter, as there were signs of slightly improved prices.

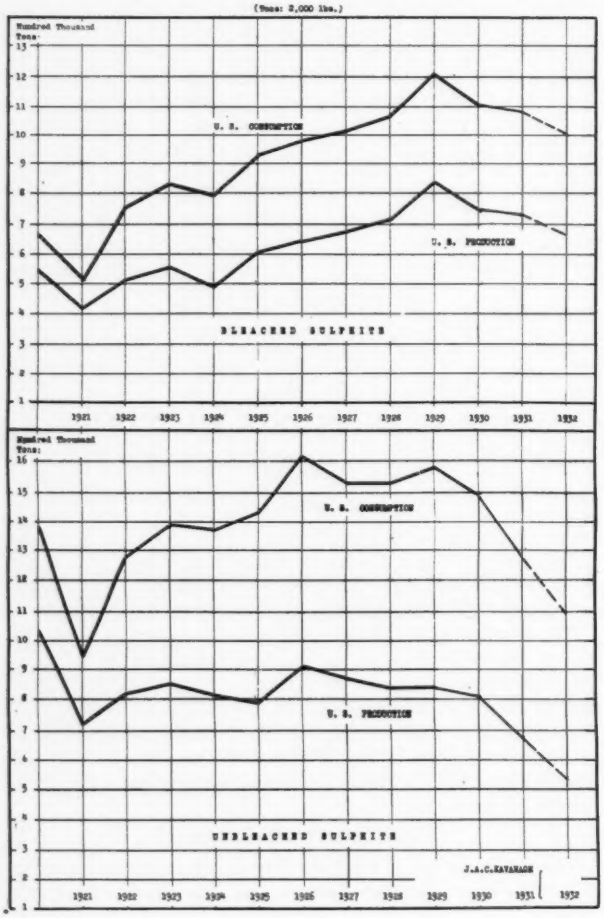
Wood Pulp Tariff Proposal

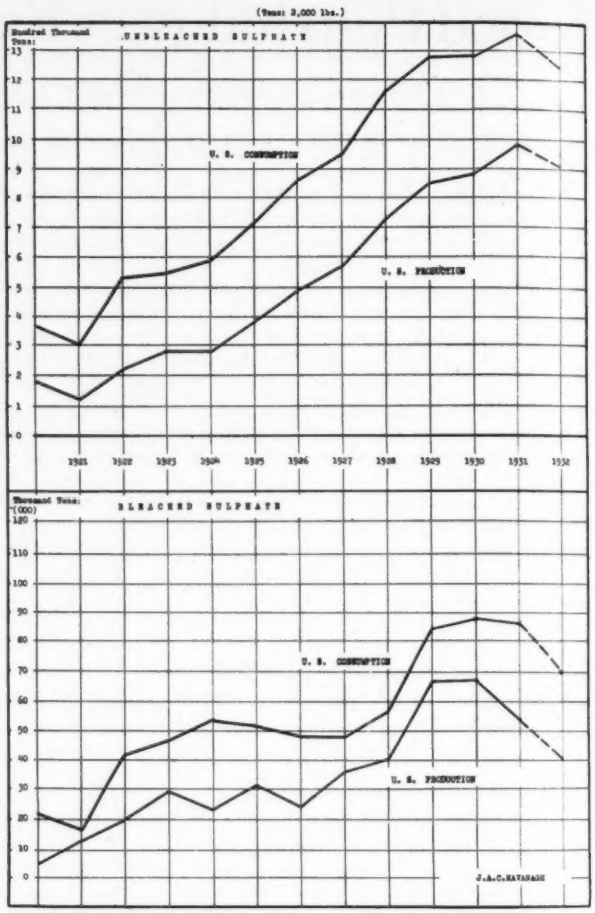
The prospect of a duty on woodpulp created considerable discussion, pro and con, in the trade and, according

to a brief against such a tariff by a committee opposing duty on wood pulp, the agitation in favor of a duty was largely due to the uneconomic development of the pulp industry in certain States on the Pacific Coast. The committee contended that wood pulp should be allowed entry into the United States without restriction or duty because if the imported pulp was excluded in this market, the selfcontained mills would then be in control of the pulp industry and by fixing prices on pulp, they would eventually also control the paper industry. But paper and board manufacturers, making their own pulp, as well as some of the converting mills, were of the opinion that the entire pulp, paper and board industries combined would be benefitted by such a duty because it would have a tendency to increase prices of the products made from wood pulp, whether imported or domestic.

World's Normal Tonnage 18,000,000 Tons

It has been estimated that the total tonnage of wood pulp produced in the world is approximately 18,000,000 tons under normal conditions and, according to preliminary reports concerning the tonnage manufactured last year, the production was about 12,000,000 tons, or equal to a decrease of about 33 per cent. As usual the United States headed the list of all countries in tonnage manufactured with about 30 per cent of the world's production, Canada took second place, and Sweden third. United States was also the largest buyer, for which there is an important reason, namely that there are about 550 paper and board mills scattered throughout the country and these mills are to a large extent dependent on imported wood





pulp for their requirements. Sweden was the largest exporter, Canada second, and Finland third.

Quality of Pulp Improves

Contrary to several preceding years, 1932 has to its credit to record a gradual and in some instances marked improvement in imported bleached sulphite pulp, whereas the quality of this particular pulp manufactured abroad was in former years, with the exception of a few cases, either at a standstill or on a downward trend. A change in this respect took place last year, when several imported brands were brought right up to date, so to speak, by the improvement effected both in quality and uniformity.

Gratifying Results

Special efforts were made to meet the demand of the American market and the results accomplished have been most gratifying to the users. By this I desire to have it clearly understood that I do not wish to imply that the product of the American mills have deteriorated or slowed up its advance towards perfection of quality, but submit this information as an item of interesting news.

Two Great Pulp Mills Added

Two great pulp mills were added to the already numerous mills namely, the Weyerhaeuser mills at Longview, Wash., manufacturing bleached and unbleached sulphite of excellent quality and the Ostrand kraft mill in Sweden, which is one of the largest and most modern of its kind. Numerous sales of rather minor quantities of sulphite and

kraft pulp were made at the close of the year, but strictly new business for 1933 was rather insignificent, for which the uncertainty as to future developments, together with overlapping shipments against old contracts, was probably partially responsible.

While there is no doubt that there is a long and rugged road to be traveled before a somewhat near to normal condition will prevail, there are now some symptoms of recovery and signs of an all around improvement, and the feeling in general is more optimistic. We have emerged from "Dreamland" and have had three years of hard training to face facts and that alone must be an important factor in our united efforts to bring about readjustments and improve conditions.

Paper Stock Industry Has Very Trying Year

By Walter R. Hicks, of Daniel M. Hicks, Inc.

THE year 1932 hath crawled, Dragon-like, into the darkest chasms of the past. And may the host of other years champion the cause of enterprise and industry by slaying this monster, whose ravages hath sapped the vitality of human existence, and threatened the institutions of organized society. But there comes upon us another year we are pleased to call a "New Year", and may it bring with it the courage to carry on, the vision to see the Star of Hope, and may faith be restored and success be the reward of honest endeavor.

Supply and Demand

The formula of business is Supply and Demand. We have passed through a phenomena of this law and its cross currents and undertones have distorted it beyond the comprehension of human understanding. Theories have been advanced, and solutions prescribed, but the chief solace now is that in the opinion of the experts the worst is past. That we have turned the corner—and may it be the corner around which prosperity lies.

1932 A Trying Year

1932 was a trying year. Everybody trying everything, and everything trying everybody. Ordinarily we study cause and effect—but today we have the effects, and the world looking for the cause. It has been blamed on everything, from the Hawley-Smoot Tariff to the over-commercializing of foot-ball. Congress has been delving into the recesses of its brain for a solution—but its brain has been on a recess. There is one thing we can count on—if the Beer Bill is passed lunch will go back on the Free List. We live in a land of plenty. Plenty of want, and yet there is a great plenty of all the things that go to make up the necessities of life. There is an over-abundance of supplies on the one hand, and an extraordinary demand for these materials that may be sufficient to strike a balance, but there is lacking the medium of exchange necessary to bring these two forces together in trade. The Pendulum, which we are pleased to use to illustrate the swing of business, must surely have reached its negative extremity when the Republicans of the country have elected a Democratic president, and, although viewed with misgivings by many, a solution may be forthcoming in the "New Deal."

Raw Material Below Production Cost

Our interest is in the paper making industry, and this country-wide condition had its effect on the paper industry, but to interpret these influences and trace them through to the paper trade is a task beyond the brain of any ordinary human. We do know that raw material in many cases could be bought below the cost of production, which is a disastrous state of affairs in any line of business. Pulp comes under this heading and to trace its effect on the trade, low priced pulp means low priced waste paper. So also is the case with New Rags—and low priced New Rags means low priced Old Rags—and that pretty well sizes up the situation as regards paper stock in general.

Waste Paper

Although Pulp largely governs the value of Waste Paper, the prices of some grades of Waste Paper showed a marked advance in the last half of the year in face of falling pulp prices. But the prices of these grades of Waste Paper had fallen to such low levels, the advance was not sufficient to bring them up to the normal differential in value between these two classes of raw material. Soft White Shavings, for example, went from $1.15 to $1.55, and Hard White Envelope cuttings from $1.45 to $1.75. Old Kraft Papers showed the sharpest advance of over one hundred per cent., going from a low of 50 cents to a high of $1.10. News was next in line, advancing from 22½ cents to 45 cents. Book Stock went from 40 cents to 55 cents, and although there was an advance in Mixed Papers of 10 cents per hundred pounds, the price going from 15 cents to 25 cents it was not sufficient to permit of the handling of this grade at a profit. This period of improvement began in early August and lasted through October, easing off until at the end of the year many grades were back to the low level of the first six months. While this improvement was a bright spot in a dull year, it was not of long enough duration to permit the trade to operate at a profit for 1932.

New Rags

With the fine paper mills operating at about fifty per cent. of capacity, and the lack of garnetting due to the low price of staple cotton New Cuttings remained dull all year. White Shirts stayed around $3.70 to $3.80; Light Silesias $2.75 to $3.00; Blue Overalls from $2.75 to $2.90, and Light Prints from $1.60 to $1.75. Fancies and Washables were in very moderate demand, the former selling as low as 1 cent a pound, and the latter around 75 cents per hundred pounds.

Old Rags

1932 was the worst year in the history of the rag business. Roofing, ordinarily the volume grade, was obtainable at very low prices as the demand was at its lowest ebb of all times. No. 2 Roofing selling as low as 30 cents f.o.b. New York. There was also a very moderate demand from the fiber mills, and what stock moved was at low prices. The fine paper mills used less of old stock because of the more desirable New Rags which they could purchase at favorable prices.

Another disturbing factor in the market was the selling of distress lots because of the need of money, or room, or both. Such lots were dumped on the market, buyers getting them at almost any price, and until this sort of thing ceases, there can be no stability of prices. The paper mills, as well as the paper stock houses, would like to see this sort of competition eliminated, and it is hoped that conditions in 1933 will permit of the re-establishing of business on a sound basis.

Chemical Industry Affected by Depression

By Guy A. Gardner, Manager, Chemical Division, M. Gottesman & Co., Inc., New York

ONE of our well known pulp specialists who is famed for his story telling ability tells one about an English cab driver of the old school who owned a horse that was about ready to qualify for the bone yard.

One day, so the story goes, the cabby drove up to his favorite "pub" and started towards the door of the saloon with the idea of refreshing himself with a drink of his favorite " 'alf and 'alf." Just as he reached the door, a little street urchin piped up a request to " 'old your 'oss, Mister?" to which the cabby agreed and went in to get his drink. When he came out he found the horse lying in the street where it had fallen through sheer inability to keep right side up. Greatly incensed, the cabby gave the youngster a slap on the ear and said "Git outa 'ere, ya young rascal! See wot ya've done now! Ya must 'ave been leanin' agains' im."*

Considering the record of the past year, it would seem that the chemical industry must have been "leaned against" considerably because it fell down heavily in production and prices suffered severely. Of course, this condition was evidently not peculiar to the chemical industry, as shipments to the various chemical consuming industries declined steadily during the year. Papermakers' chemicals were no exception to the rule as curtailment of production became more and more widespread among pulp and paper manufacturers. In all chemical consuming lines, the desire to have inventory figures as low as possible kept buying on a hand-to-mouth basis with contract tonnage moving slowly especially during the last six months of the year.

Quotations Fluctuate

In the first half of 1932 prices, while easy, showed few major changes although rumors of sales at less than market levels were numerous. The last six months, however, brought a great many substantial reductions in prices, notably a sharp decline in the price of Liquid Chlorine and many of the large consumers of this product made their contracts for 1933 delivery at the reduced price. At the close of the year, the chlorine manufacturers were successful in putting the price back to the previous level.

Soda Ash and Caustic Soda prices kept on a fairly even keel during the year although the consuming demand was considerably less than a year ago. Contract prices for 1933 were about the same as the 1932 schedule.

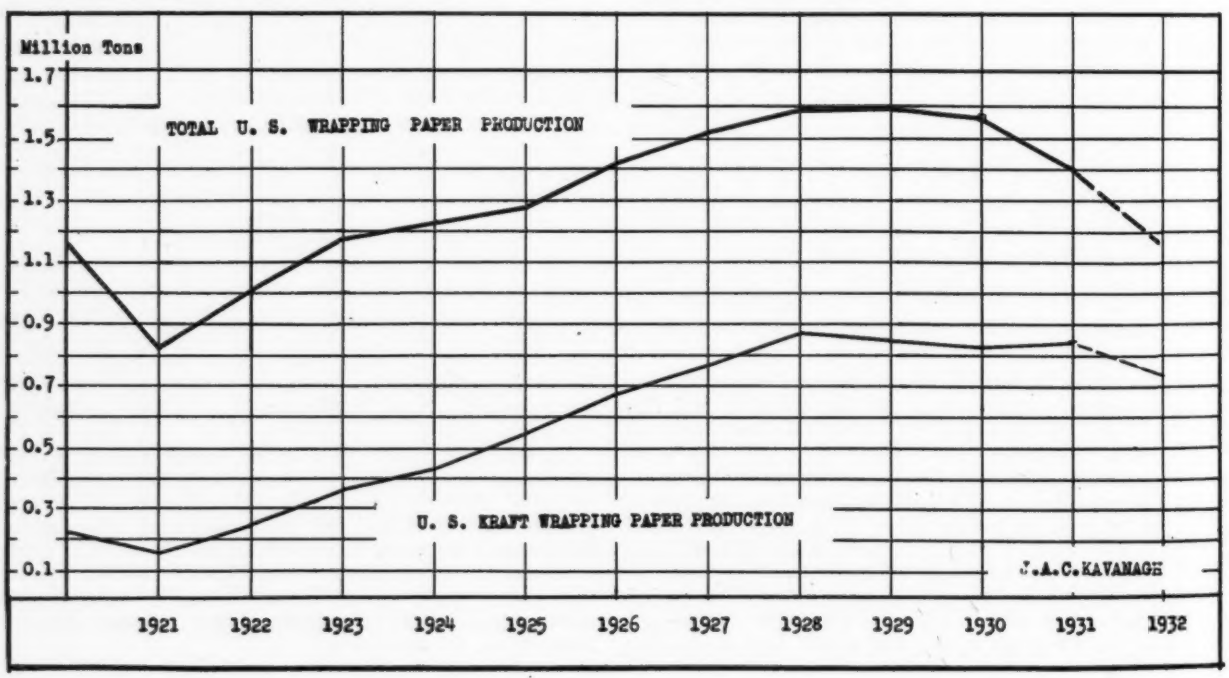
Sulphate of Alumina (papermakers' alum) had its ups and downs during the year but on the whole the price improved slightly from the very low quotations prevailing during 1931. While tonnage taken by the papermakers was less than during the preceding year, the market held fairly firm.

Salt Cake Irregular

The lessened demand for Salt Cake made the price somewhat easier. However, curtailment in the production of Muriatic Acid, of which Salt Cake is a by-product, brought about a reduction in the available Salt Cake supply so that even though the movement of tonnage was cut down a good deal in 1932, the price for contract shipment held fairly well although several sales of spot lots at price concessions were reported.

While the Chemical Industry has felt the effects of the depression severely, it has not fared as badly as some other lines of manufacture, in fact it stands near the top of the list as far as rate of operation is concerned. Chemical manufacturers during the last year or two have done a lot of much needed house cleaning, perfecting and improving their producing facilities so that they are now turning out better qualities of their various products at reduced cost. Thus the foundation has been laid for the gradual improvement in business which everyone now feels cannot be long delayed.

* By special permission of copyright owner.



Canada's Paper Industry Has Stormy Year

By C. L. Sibley, Regular Correspondent of the Paper Trade Journal

WITHOUT doubt, the year 1933 was a year of storm and stress for the pulp and paper industry of Canada, and the end is not yet. When the year began much hope was centered in a powerful Bankers' Committee which had been formed under the chairmanship of E. W. Beatty, K. C., the president of the Canadian Pacific Railway, with the object of finding a solution for the chaotic condition which had been created by the fact that leading news print units had defaulted on their bonds and had been placed in the hands of receivers.

Move for News Print Dictator

The Committee has been working the whole year, with the co-operation of various leaders in the industry, to devise ways and means to avert a general collapse and work out a permanent plan of stability. So far there has been no definite result. The major evil resulting from present conditions is that of price cutting, and the situation now is such that demands are coming forward for the appointment of a dictator for the news print industry, it being freely stated that the Provincial Governments will be compelled to take action if the news print executives fail to come together.

Among the prominent men who express themselves to this effect is Sir Herbert Holt, who is not only the president of the Royal Bank of Canada and a leading industrial magnate, but who has been an outstanding figure in the news print industry for years. Speaking recently at the annual meeting of the Royal Bank shareholders, he said:

"Probably no major industry in Canada, save railways and agriculture, has suffered more from the drastic decline in consumption than the Canadian news print industry, with the result that the mills find themselves with productive capacity far in excess of present-day requirements.

"The difficulties in the industry have been materially enhanced by extreme and unjustly competitive methods, which have resulted in the burdens due to lower consumption bearing more heavily on some plants than on others.

"The view which is still expressed that high-cost producers should be eliminated and capital structures pared down, can now be regarded as almost meaningless. In substance, this adjustment has already taken place and high-cost mills are not now operating. In spite of drastic economies, the industry now faces the difficulty of covering its actual operating expenses, before provision for any interest or depreciation. In these circumstances, a continuation of price-cutting methods is not in the interests of the people of this country, particularly the workers in our woods and mills, and if the strong efforts that are being made to secure co-operation are not successful, Provincial Governments must take steps to conserve Canadian natural resources, and to prevent the collapse of this vitally important industry."

Price-Cutting Epidemic

During the year price-cutting broke out in what looked like epidemic form, and for a time there was a "free-for-all," resulting in considerable switching of contracts. When the year began there was a price cut (announced in December) of $4 per ton for news print, making the price for 1932 delivery in New York $53 per ton. As the year went on it became an open secret that the standard price was not being observed by all manufacturers, rebates, commissions, and other devices being used to bring down the price to the publishers.

The result was that the price was cut further by $8 a ton. At the present moment evidence is forthcoming that the Bankers' Committee has been able to secure a new measure of co-operation among the news print producers, as a temporary achievement of relative stability until such time as a broad plan can be worked out which will place this major Canadian industry on a sound basis.

Drop of $100,000,000 in Exports Since 1929

How the depressed condition of the market combined with price-cutting, has affected the industry may be gathered from the statement that in the twelve months ended December 31 last the value of the exports of pulp and paper showed a falling off of $35,926,822, as compared with the previous twelve months; of $80,146,112, as compared with 1930; and of $100,833,096 as compared with 1929.

The principal decrease was in news print, which was less by $24,266,913 than in 1931; less by $50,300,000 than in 1930, and less by $65,899,449 than in 1929. Details of the exports of pulp and paper for 1932 as compared with those in 1931 are as follows:

Paper	1932	1931
News print	$82,966,199	$107,233,112
Others	3,357,540	3,880,870
Total	$86,323,739	$111,113,982
Pulp:		
Sulphate	2,318,760	3,617,444
Sulphite (bl.)	11,181,623	16,282,735
Sulphite (unbl.)	2,596,647	5,109,732
Mechanical	2,562,089	4,616,167
Screenings	77,937	224,434
N. O. P.	82,978	178,909
Total	$18,920,064	$30,056,643
Total P. & P.	$105,243,803	$141,170,625

Expressed in terms of tonnage, the export of news print from Canada for the past four years has been as follows:

	Tons
1929	2,515,495
1930	2,332,510
1931	2,008,241
1932	1,776,763

Thus the falling off last year was 231,478 tons as compared with 1931, 555,747 tons as compared with 1930, and 738,732 tons as compared with 1929, the latter being the peak year.

Production and Capacity

The total production of the news print mills of the Dominion for 1932 was 1,907,566 tons, as compared with 2,729,000 tons in 1929, 2,504,000 tons in 1930, and 2,221,000 in 1931. The mills have a total capacity of 12,450 tons daily. Taking the working days as 300 per annum, this means a capacity for the production of 3,735,000 tons per year. It will be seen, therefore, how far production falls short of capacity.

Of course the official rating of the mills is apt to be misleading. It would be impossible for the mills to turn out capacity production without loss on the basis of the present prices. Much of the machinery installed in Canadian mills is far from modern. What proportion of the machinery is obsolete it would be difficult to determine. Cost of bringing pulpwood to the plant, cost of power, and cost of transporting the finished product to the market are all matters of importance. On the basis of age, together with known facts on cost figures, it is presumed that not more than one-half, probably less, of the installed

capacity can be operated profitably at the present price level. Of course, the percentage of effective machinery would rise with an advance in the price of news print, but it is estimated that under normal conditions, and disallowing outside factors which cannot be foreseen, it will take from eight to ten years before a level is reached permitting capacity operation by Canadian news print mills.

Financial Aspect of the Industry

The financial aspect of the industry is one that is at present attracting much attention. In 1931 the capital investment in the pulp and paper industry was $630,000,000, of which $309,875,059 was in the Province of Quebec, $194,772,433 in Ontario, $52,256,905 in British Columbia, and $73,272,143 in Nova Scotia, New Brunswick and Manitoba. Of the total investment $85,324,604 was in mills making pulp only, $515,758,807 in combined pulp and paper mills, and $29,544,000 in mills making paper only. The actual investment in land, buildings, machinery and equipment of all mills was $509,420,857. Operating capital (cash, accounts, etc.), represented $63,016,203, the remainder to make up the total investment of $630,176,540 being represented by materials, stocks, finished products and supplies on hand.

The production of all the pulp and paper mills in 1931 (the latest figures available) had a value of $174,733,954, of which $85,162,453 was from Quebec mills, $21,313,577 from Ontario mills, $4,118,602 from British Columbia mills, and $7,802,618 from mills in Nova Scotia, New Brunswick and Manitoba.

The total payroll in 1931 amounted to $34,792,073, as compared with $45,774,976 in 1930, and the total number of employees in 1931 was 26,669, as compared with 33,207 in 1930.

Over 2,000 secondary industries depend upon the pulp and paper industry for raw material, and these have a capitalization of $180,000,000 and a payroll of $163,000,000.

High Relative Importance in Export Trade

The above figures serve to indicate the national importance of the pulp and paper industry and to emphasize the serious concern which is manifested by the provincial and federal governments over the ruinous conditions with which the industry is now faced.

But even more striking figures along these lines can be presented. In 1931 the value of the exports of products of the pulp and paper industry was $150,530,277. This included pulpwood, pulp, paper and paper goods other than books or printed matter. These products alone formed a quarter of the value of the total export trade, and in themselves exceeded the value of any other group except agricultural products. This total of $150,530,277 approached the total value of grain and farinaceous products, which amounted to $161,835,076.

The following table gives the values of the fifteen leading commodities exported from Canada for the fiscal years ending March 31, 1930, 1931 and 1932, and shows the high relative importance of pulp and paper exports:

Commodities	1930	1931	1932
Wheat	$215,753,475	$177,419,769	$115,739,383
News print	145,401,482	127,262,706	103,003,352
Wood pulp	44,913,995	35,061,689	27,684,782
Fish	34,767,739	27,895,851	23,594,230
Wheat flour	45,457,195	32,876,234	18,897,543
Planks and boards	49,446,887	31,598,202	18,766,452
Raw gold	34,375,003	17,832,608	13,671,565
Copper bars, rods, etc.	48,181	1,703,703	13,057,733
Raw furs	18,706,311	14,936,813	12,110,157
Nickel	25,034,975	18,246,735	12,109,400
Whiskey	25,856,136	18,722,198	11,622,256
Cheese	18,278,004	12,989,726	10,593,967
Barley	10,388,735	1,169,403	10,002,911
Pulpwood	13,860,209	12,040,484	8,196,144
Fresh apples	8,111,943	7,095,719	6,537,584

Over-Capitalization Is Blamed

The national importance of the pulp and paper industry as thus revealed, makes it a matter of general concern that under present conditions more of the news print companies are paying dividends on their common stock, many have defaulted on their bonds, and some of the larger as well as the lesser, ones are in the hands of liquidators, or are being operated by committees of bondholders.

That the industry has been over-capitalized as well as over-expanded is now obvious to all. The Hon. H. H. Stevens, Minister of Trade and Commerce for the Dominion, stated in Montreal recently that world conditions were not responsible for the present perilous state of the industry and neither were taxes. "The industry," he said, "has been over-capitalized, it has indulged in over-expansion and has been placed at the mercy of the man who is only interested in selling bonds and clipping coupons."

John Stadler, a veteran in the business, who was present when Mr. Stevens made these remarks, declared that the industry is now being operated for stock-jobbing purposes, and would not be improved until it was operated efficiently. "You have one of the best industries in the world," he remarked, "but it is in the hands of the financiers. Should such an industry be in their hands? I say no."

Reorganizations of News Print Companies

Reorganizations of most of the leading units in the pulp and news print industry in Canada have been carried out during the year or are in process. The most outstanding reorganization was that of the Canada Power and Paper Company, which, together with its subsidiaries, was taken over by Consolidated Paper Corporation, a new company, with L. M. J. Betnap as president. A feature of the reorganization was a drastic reduction in capitalization. Price Bros. & Co., Great Lakes Paper, Abitibi, Lake St. John Power and Paper Co., Minnesota and Ontario Paper Company, and the Fraser Companies are some of the leading organizations which have been or still are in process of reorganization.

When Canada Power and Paper was reorganized, the Anglo-Canadian Pulp and Paper Company, which had been in the merger, reverted to its former status as an independent company. This concern is in the control of the Rothermere group of papers in England, and at the time of writing it had just been put in a very strong position through the amazingly successful issue in England by the *Mirror* Newspapers, Ltd., of £2,200,000 five per cent guaranteed first mortgage debenture stock. Within ten minutes of the list opening the offer was covered ten times over. The issue is part of the funds required for the *Daily Mail* Newspapers, Ltd., to subscribe for £3,230,000 of the new five per cent debentures which the Anglo-Canadian Pulp and Paper Mills are creating to replace their existing 6½ per cent debentures. The mill is located at Quebec, and Viscount Rothermere is president.

Another interesting development of the year is the fact that Canadian International Paper Company was made the holding and operating company of all of International Paper and Power Company's pulp and news print properties in Canada and Newfoundland. The combined capacity of these plants places Canadian International in the position of being one of the largest news print operators in Canada or the United States, with main plants at Gatineau, Hawkesbury, Kipawa, Three Rivers, Dalhousie and Cornerbrook, the last named in Newfoundland.

Book Paper, Board, Etc.

While news print is the outstanding factor in the situation, due to its large production and to the fact that 90 per cent of the product is exported, importance attaches

to other paper and paper product manufactures, which are largely for the domestic market. Without exception these branches of the industry had a difficult year, due to decline in demand and falling prices. The operations of the book and writing paper mills were on a lower scale than for many years. The falling off on the lower grades of book paper were not even counter-balanced by the fact that owing to the tariff on foreign magazines, copies of certain popular American magazines for Canadian distribution are now printed in Canada.

Imperial Economic Conference

One of the outstanding events of the year was the Imperial Economic Conference, held at Ottawa in the interests of inter-Empire trade. At this conference trade treaties were drawn up between Canada and other Empire countries which are expected to be mutually advantageous.

While organizations of paper makers, both of Great Britain and Canada, held watching briefs at Ottawa during the conference, they did not work for any particular concessions. There was talk at one time of Canadian operators seeking concessions that would give a wider market in Great Britain for pulp and news print. This proved to be merely newspaper talk, however. As far as Canadian operators were concerned, all they sought was a continuance of the tariff preferences already in effect on certain classes of wrapping paper and pulp and fibre wall boards. These preferences, which would normally have expired in November, it was agreed to continue indefinitely. So far no particular benefit has accrued, the low exchange value of the pound sterling as compared with the Canadian dollar militating at present against any marked growth of export to Great Britain. Nevertheless, the preference has enabled some of the Canadian board mills to relieve the Canadian market of a certain percentage of their excess tonnage, and exports to Great Britain are showing a promising tendency to increase.

Water Power Development

Water power development, which is intimately allied with the pulp and paper industry, was confined during 1932 to undertakings already in course of construction at the beginning of the year. No new works of magnitude were initiated. Installations during the year resulted in a net addition of 378,923 hp. to the Dominion's total, bringing it to a figure of 7,045,260 h.p. Construction is continuing on several large undertakings which will increase the total in 1933 and subsequent years.

The increase in installation in 1932 was accounted for chiefly by the Beauharnois development in Quebec, the Chats Falls plant on the Quebec-Ontario boundary, and the Cora Linn development on the Kootenay river in British Columbia.

In Ontario the Abitibi Power and Paper Company carried work forward actively on a 330,000 h.p. development on the Lower Abitibi River in the north of the Province. In July, however, financial difficulties caused cessation of operations and the plant is now being taken over by the Ontario government.

The Maclaren interests, which have a large news print plant at Masson, in Quebec, made good progress on a new 130,000 h.p. development on the Lievre River at Masson, and it is expected that the plant will begin operation by July of this year. The company has a contract with the Ontario Hydro-Electric Power Commission for the current.

The Shawinigan Water and Power Company, which supplies power to the large pulp and newsprint mills in the St. Maurice Valley, has made progress on its 240,000 hp. development at Rapide Blanc, on the St. Maurice River. Installation of units is expected to be made this Spring.

The large central electric stations in Canada in 1932 are estimated to have had an output of 15,986,414,000 kilowatt hours, as compared with 16,315,670,000 kilowatt hours for all stations in 1931. There was a large increase during the year in Quebec stations, which produced 360,765,000 kilowatt hours more than in the previous year. Exports to the United States dropped from 1,235,325,000 kilowatt hours in 1931 to 667,879,000 kilowatt hours in 1932, a decrease of 567,446,000 kilowatt hours, or 46 per cent.

Electric Current for Heating in Mills

Owing to the increasing supplies of hydro-electric current being made available, a marked feature in the operation of pulp and paper mills during the past year has been important further developments in the use of electric current for the production of hot water and steam used in connection with the grinding, cooking or digesting of wood in the course of its manufacture into pulp. This displaces large quantities of coal, the low rate quoted on current effecting an economy in this direction, at the same time bringing revenue to the power companies for current for which otherwise there would be no demand.

In the use of hydro-electric current for this purpose the most important developments have been by the Shawinigan Water and Power Company in the St. Maurice Valley and Quebec districts. Figures in this connection for 1932 are not yet available, but for the year 1931 the total amount of electricity used by the pulp and paper mills was 6,143,814,716 kilowatt hours, 977,547,063 kilowatt hours of this being generated by the mills for their own use. The quantity used for electric boilers was 2,032,283,425 kilowatt hours, of a value of $2,887,938, and the quantity used for other purposes 3,133,984,228 kilowatt hours, of a value of $11,349,573. Attention may be drawn to the difference in the cost of electricity for heating purposes and that for motive power and lighting purposes. Of the amount of electricity used for electric boilers in the mills 1,550,496,967 kilowatt hours was in Quebec, 320,183,458 in Ontario and 161,603,000 in other provinces. Of the amount used for other purposes in the mills 1,198,605,885 kilowatt hours was in Quebec, 610,110,819 in Ontario, 7,195,966 in British Columbia, and 538,071,558 in other provinces.

Rushmore Mills Start Production

WINDSOR LOCKS, Conn., February 14, 1933—The Rushmore Paper Mills, Inc., of this place which last summer took over the former J. L. N. Smythe company plant, has advanced its experimental work to a point where it is getting into systematic production of waxed paper, which it manufactures into luncheon rolls, put up in various forms of package for sale through the stores. The plant is controlled by James S. Wemyss of Brooklyn, N. Y., who ran a plant at Green Point, L. I., which was burned about six years ago, and who also has a plant in New Hampshire.

China to Build Government Paper Mills

Plans for a paper mill are under consideration by the Chinese National Government, according to a report to the Department of Commerce from Vice Consul L. C. Reynolds, at Nanking.

The paper mill is to be erected in cooperation with leading paper consumers of Shanghai and the government will advance funds to assist in getting the enterprise into operation, it is reported. The pulp mill is to be located at Hangchow, in Chekian Province and the factory for manufacturing finished paper in Shanghai.

DOWNINGTOWN

Like the general store of the rural district supplies practically every merchandise need of its community, Downingtown can supply practically every type of machinery used in the paper or board mill. . . . If you do not have our 200 page general catalog on file, write us. And when you need any kind of mill machinery, let us bid on your requirements. The Downingtown Manufacturing Co., Downingtown, Pa.

The MARKET PLACE of the Paper Industry

Paper Men Hold Annual Meetings in New York

American Paper and Pulp Association, National Paper Trade Associations, Technical Association of the Pulp and Paper Industry and Numerous Paper Organizations Hold Conventions at Pennsylvania Hotel—Many Topics of Vital Interest Discussed

DESPITE prevailing business conditions, "Paper Week" at the Hotel Pennsylvania, New York, attracted satisfactory attendances of manufacturers and merchants from practically every section of the country. At the annual conventions of the American Paper and Pulp Association, the Technical Association of the Pulp and Paper Industry, the National Paper Trade Association of the United States, and affiliated organizations, many interesting and informative addresses were rendered by prominent leaders and technicians of the pulp and paper industry.

The Fifty-Sixth Annual Meeting of the American Paper and Pulp Association, which was held at the Hotel Pennsylvania on Thursday morning, proved one of the most interesting gatherings in the history of the organization. W. J. Raybold, of the Rising Paper Company, discussed "Relations Between Merchants and Manufacturers" and declared that they were all in the same boat and must come ashore together. He said that progress had been made of late along the lines of cooperation in place of the old spirit of antagonism and stressed the importance of adhering closely to the trade customs of the industry.

Seldon Wardwell, director of the Great Northern Paper Company and of the St. Croix Paper Company, discussed the effect of depreciated currency on the news print industry. He showed how prices had declined to an unprofitable level due to foreign competition, and also mentioned the fact that many news print mills had been forced into the manufacture of other grades which were already overcrowded. Mr. Wardwell expressed the view that tariff protection was necessary in order to save this important industry. He declared that there was no economic reason for neglecting news print paper and protecting other grades of paper.

Dr. Arthur Faubel, of the American Tariff League, analyzed the tariff situation very efficiently and spoke highly of the work of the Import Committee of the American Paper Industry in protecting domestic manufacturers against improper importation of various papers.

Phil A. Howard, publisher of the *American Paper Merchant* and president of the Paper Foundation, Inc., made a brief talk on the proposed Paper Exhibit at the forthcoming Century of Progress Exposition in Chicago. He described the steps already taken and made an urgent appeal to all the manufacturers to support this movement. Newton D. Alling, formerly with the Irving Trust Company, spoke on the "Share-the-Work-Movement."

The Nominating Committee of the American Paper and Pulp Association, which had met the previous evening, reported with gratification that it had been able to prevail upon President S. L. Willson, of the American Writing Paper Company, Inc., to serve for another term. In accepting the nomination, Mr. Willson remarked, in the words of Shakespeare, that "Some men are born great and others have greatness thrust upon them." He said he was in the latter class.

Other officers elected were: First Vice-President, W. L. Carter, Nashua Gummed and Coated Paper Company; Second Vice-President, Dan K. Brown, Neenah Paper Company and Secretary, Charles W. Boyce.

Executive Committee: Henry D. Schmidt, Schmidt & Ault Paper Company; Norman W. Wilson, Hammermill Paper Company; D. C. Everest, Marathon Paper Mills Company; Merrill B. King, Rex Paper Company; J. M. Harvey, Advance Bag and Paper Company and J. L. Riegel, Riegel Paper Corporation.

The president's annual address follows:

President Willson's Address

Sidney L. Willson, president of the American Paper and Pulp Association, delivered his annual address as follows:

"Another eventful year has passed—a year filled with difficult problems for every one, and for associations as well. The American Paper and Pulp Association has felt the depression to a marked degree, because of necessary economies effected by its members in their respective companies—quite a number of whom resigned from the Association for economic reasons, or because the Association did not act in harmony with their particular views, or because it was too active in some other direction or because it was neutral and did not act at all.

"For the past ten years it seems to me I have personally contacted with the whole calamity family—and while it may be considered a rash statement to make, I am getting so I like it. I don't know of anything that makes a man as self-reliant as facing new or difficult problems, if he does not give up looking for a solution of them. During the past four years as President of your Association the problems have been numerous and some difficult of solution. We now have some ahead of us. Changes in life are constantly taking place—changes in methods of doing business and changes in our ideas of co-operation. Distress makes us think—and we think not only of ourselves—but of others, and we have found that by helping others we secure for ourselves the greatest benefits. Our Association, because of the constant evolution that is going on, may need a change in its organization structure. I am personally convinced that such is the case and I have recommended to our National Paper Council that a Committee be appointed to carefully consider this subject, because I believe the industry with its marvelous growth during the past thirty years has developed problems which the present Association is unable to cope with as it now functions.

"One of the problems of your Association during the past two or three years is its finances, and this has been acute during the past year because of a falling off in membership due to reasons above stated. The income was about cut in half. How to keep the Association alive has been a real problem. The Secretary's report will give you some of the most important things accomplished which has made that possible. His report is one that reflects great credit upon him and his office staff.. It gives a concrete demonstration of what can be accomplished through cooperative action, self sacrifice and efficient management,—an example that is worthy of emulation and praise. With a greatly decreased income, the large

Keep Up

Keep up your courage. Keep up the quality of your Paper. Keep up your property. But above all, keep up your Beaters. "Your Paper is made in your Beaters."

Keep Up

Keep up your Beaters. Take no risks now. Consult us if your Beaters are out of date, or need repairs, or are not sufficient for your needs. "Your paper is made in your Beaters."

Keep Up

Dilts
MACHINE WORKS, Inc. FULTON, N.Y.
"Your Paper is made in your Beaters"

deficit, existing last April has been almost wiped out. This has been accomplished by radical cuts in salaries—part time employment and by the suspension of those activities which would not, if deferred, lower the standard of value and usefulness of the Association to the industry.

"The industry through its Statistical Department has kept us posted on important changes in production and consumption of Paper and Pulp.

"In 1932 the paper industry underwent further disastrous widening in the spread between production capacity and actual output. The rate of operation for the industry as a whole decreased from 67 per cent in 1931 to 57 per cent in 1932. Co-incident with this was an alarming decline in paper prices. Shortly after the first of January, 1932, government awards set prices on tonnage grades at levels which, in most cases, were below those of 1913. Within a month the whole paper market began to sag, and before the year was out prices in most grades had fallen below the government bid prices. The bids for 1933 reflect another sharp decrease in prices, in most cases they are again far below the market, and far below a sensible price for the commodities purchased.

"Yet the downward trend of paper prices is not out of harmony with the general decline in all commodity prices that has occurred in the past year. The price index based upon 1926 as 100, dropped from an average of 73.0 in 1931 to 63 in January, 1933, and there is no indication in these figures that the decline has even started to slow up yet.

"So long as prices are declining, American business faces an intolerable situation. The burdens of taxation and of debt, to say nothing of the return upon capital invested, are impossibly heavy at the present price levels. This towering problem affects every activity of American life; it is particularly burdensome upon our governmental agencies which are struggling between the necessity for reducing expenditures on the one hand and the necessity for increasing tax rate upon an ever decreasing tax base, on the other hand. The support of our governments is at stake. The rather insignificant reductions that have taken place in expenditures to date, must be tripled if tax payments are to be reduced to the levels that industry can support.

"In the chaotic tumbling of prices, few commodities have been exempt. The effect has been greater perhaps in some commodities than others; but it has been particularly important in raw materials and farm products. In many cases there has been a delay in the adjustment of prices of finished products but as time goes on this factor is being taken up by the further declines in retail prices.

Moves to Bolster Prices

"Prices constitute the most important problem facing the United States today. It is so recognized not only by industry but by political and social agencies as well. Congress has been flooded with bills that would provide remedies. Inflation and agricultural allotments, and straight out and out subsidies are proposed. The incoming administration seems on the verge of a vast program of expenditures for public works, if the recent announcement of the flood control program in Tennessee is a criterion.

"There are objections to all palliatives that have been suggested. Deliberate inflation runs the risk of getting beyond control. Agricultural allotment has already been proven unsound in basic principle. The expenditure of huge sums in subsidies and public works must certainly increase taxes and this can be justified only if the ability of the tax payer is increased proportionately. Depreciated currency equalization is proposed as one corrective, and as such the Executive Committee of the American Paper and Pulp Association recently endorsed it in principle.

Depreciated Currency Equalization

"It has become increasingly apparent during the last sixteen months that the normally expected adjustment of internal prices and exchange rates in the depreciated currency countries has not occurred, but that a wholly unexpected result has taken place; namely, a more rapid decrease in prices in the gold standard countries, particularly in the United States.

"The available statistical information indicates that the American price level has already absorbed a third of the depreciation of the Pound Sterling. The question that faces every business man is whether American prices must decrease the other two-third or approximately 20 per cent below the present level.

"No one can say to what extent depreciated currency competition has influenced the decline in prices in the United States. Yet, no one can deny that the increasing sales of foreign goods at below-market prices are exerting material influence upon our domestic prices. Whether the equalization of currencies is sound legislation or not, the fact remains that the depressing influence of depreciated currency competition can be eliminated through legislation, and that this can be accomplished without setting up an abnormal competitive situation.

"This question is of more than ordinary importance in the paper industry because of the large quantities of pulp and newsprint paper that are imported. Sulphite pulp prices fell approximately 25 per cent in the first four months after currency depreciation set in. They have since remained fairly stable. But the decreases in American price levels that occurred in 1932 have had the effect of reversing the relative advantage in the industry. Today most self-contained mills can compete with pulp purchasing mills if they can run at high percentage of operation. This is generally recognized and we find that the self-contained mills are shifting more and more to the policy of full operation. At the same time the decrease in paper consumption, which can be definitely associated with the declining price level, is obviously making the self-contained mills more and more important in the industry so long as they adhere to the policy of full operation.

Pulp Prices

"Pulp prices, on the other hand, are apt to prove relatively fixed. It is a well known fact that European delivered prices of pulp followed exchange rates downward last year and that supplying companies were forced to depend upon the higher prices in the American market to maintain their resources. In last October, the European pulp cartel was reformed with the expressed idea of increasing prices in Europe to eliminate the difference between European and American prices.

"The extent to which Norway, Sweden and Finland control the situation has been increased during the past year. Their shipments to the United States, for instance, have formed a greater proportion of our pulp consumption than ever before and their shipments to European consuming countries were proportionately high upon the same basis. These countries now control, within rather wide limits, the pulp prices in the whole world. It is illogical to assume that they will break American prices, for by doing so they sacrifice their opportunity to increase prices in other markets which normally take a larger part of their shipments. They might better make sacrifices in their volume of shipments.

SULPHITE PULPS

AND

KRAFT PULPS

of Every Description and Suitable for All Requirements

Selling Agents in U. S. A. for the Following Pulp Mills:

Kraft Mills

HUSUM
KORSNAES
MUNKSUND
OSTRAND

Sulphite Mills

DOMSJO (MDM, MDL, D, DM)
HORNEFORS (MDM—HS, DH, DMH)
KORSNAES (Selected and L Quality Mitscherlich)
ROBERTSFORS (RI, R, RM)
STORVIK (HS, Extra Strong Mitscherlich)

Bleached Sulphite Mills

MO & DOMSJO WHITEHORSE
MOUNT TOM SULPHITE PULP CO.

Strong and Bleaching Sulphate Pulps

for Specialty Mills

KORSNAES (Strong and Bleaching)

Pagel, Horton & Co., Inc.

347 MADISON AVENUE, NEW YORK CITY

"These considerations, some of them necessarily matters of opinion, were before the Executive Committee of the Association for months before the principle of depreciated currency equalization was endorsed. It became increasingly evident that the effect of the competition would be disastrous, not only to pulp producing mills in the United States, but also to the pulp purchasing mills. The question ceased to be one of costs but one of prices. This, broadly, is the reason why the Executive Committee took the stand that it did on the principle of depreciated currency equalization.

"Some adverse criticism has been received and in some instances the executive Committee has been unfairly accused of bias. This was to be expected and the Committee therefore carefully canvassed the opinion of many executives. Despite bitter protest to the contrary, their decision represents a high type of thought in the industry.

"The general maladjustments in American business have created companion difficulties in our own industry. Outstanding among these is the shifting of production from one grade to another. There is no denying the fact that depreciated currency competition has influenced many shifts, particularly in the news print branch of the industry. Many news print companies unable to compete because of the low prices set by overseas imports, are seeking market outlets for other grades. The significance of this is easily apparent when one considers the sizes of machines of the news print industry and the far-reaching effect that the production of one machine can have upon a large number of smaller companies engaged in the manufacture of other standard or special grades. Another significant shift has been in the book paper industry to the sulphite bond, and another has been the even greater production of kraft liners by southern kraft producing mills.

"These and other shifts must be reckoned with, for this influence is far-reaching, particularly among the specialty mills. These shifts can not be stopped by declining prices, and they become more and more important as consumption of paper falls off. Their only control lies in reversing the tide of downward prices and lower consumption.

"As president of the Association, I have received many letters in which manufacturers have urged the creation of a czar with arbitrary authority to control the industry. This is a perennial suggestion not only in this industry but in many others. It is of doubtful value. What manufacturer here today is willing to delegate the independence of his action to any one regardless of his competency? Protests of the association's executive committee in endorsing the depreciated currency equalization constituted an excellent answer. The point has by no means been reached in American business where the independence of individual action can be delegated to any man or group of men. This is the fundamental difficulty with our anti-trust laws. To permit production control and price adjustment, which admittedly would be in the public interest at the present time, the public in its own protection must reserve the right to participate. How many in the paper industry would submit to even the type of control that the Interstate Commerce Commission extends over our railroads?

"But the industry working through its own organizations and with the proper cooperation between these organizations can do much to keep the industry orderly and to keep within bounds the competitive factors which are today certainly indicative of further price decreases and shrinkage in volume, if no concerted action is taken.

"Our industry has been extremely fortunate in their relations with labor. A general reduction in wages has been accomplished, not by violent action, but through a process of reason. We still have before us problems affecting labor—problems of socialistic legislation—and of capitalism to face in the future—but our industrial leaders through past experiences, and through the application of humanitarian principles, will surely successfully cope with them.

"Our industry must be prepared to face the problem of its protection by adequate tariffs. This question is one that will doubtless be discussed in the next Congress and we should support our tariff committee in a way that will make their effort effective.

"The various committees of your association will make their reports, and these will later be furnished you in printed form for your consideration. I want to embrace this opportunity of expressing my appreciation to the members of those committees for their time, thought and accomplishments.

"In closing I want to call your attention to the charts in your possession—analyzed by Mr. L. C. Reynolds—of the American Writing Paper Company, Inc.—and to use his own language in pointing out some remarkable comparisons:

" 'The Civil War, according to Mr. Reynolds, brought about conditions affecting commodity prices and business volume which in the World War were repeated. Both wars lasted for approximately four years and brought about an inflation of commodity prices to about the same level. In each instance also, the deflation curve of average commodity prices crossed the normal line thirteen years after the war.

" 'Two depressions followed in the wake of both wars. The first a minor depression as in 1921 and the second occurring exactly nine years after the peak prices occasioned by the wars.

" 'The fact that this depression has apparently plunged downward further than that of 1873 may be more apparent than real. He points out that today we are essentially industrial whereas in 1873 we were essentially agricultural, and our standard of living today includes more non-essentials, thereby bringing about greater fluctuation in business volume.

" 'The question is, whether this depression will cease at the end of six years as did that of 1873.

" 'Our curve of business descent was arrested last June and has since showed a tendency to resist further descent, and a preparation for a return of business volume. If this is followed by an upward ascent similar to other depressions, it would come back to the normal line at the end of 1935, closing exactly a six years' period.

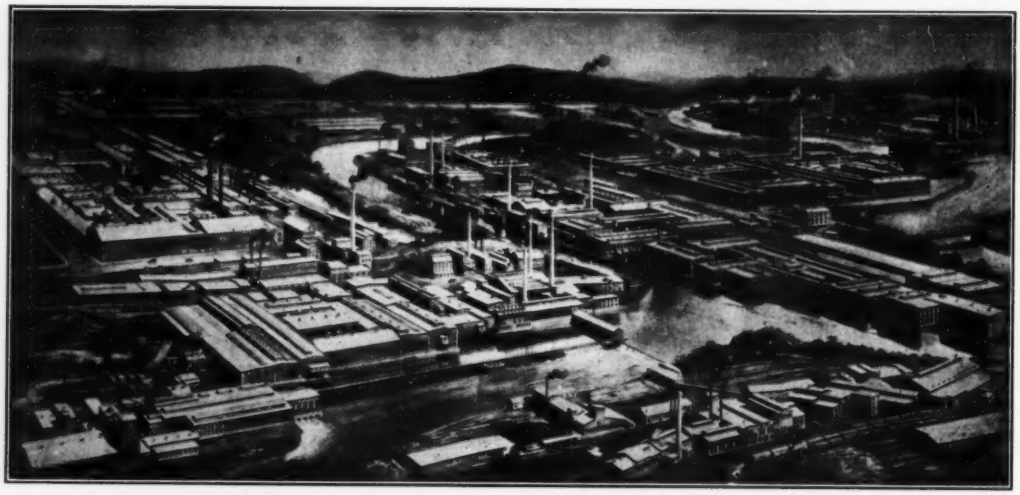
" 'If this happens the psychological effect resulting from the long ascending curve of business would carry us to greater heights of prosperity than ever before attained.

" 'It is obvious that the year 1933 is critical and that we can not well afford to have a crisis occur within any country and that recovery is largely tied up with the removal of restraints which the nations of the world have placed upon international commerce.

" 'It is equally obvious that our business cycles are somewhat like the swinging of a pendulum and that the pendulum has swung further in this depression than ever before. Regulation of industry seems to be the answer to the question as to how to keep the swings of our business pendulum from being so wide. We have always learned a lesson from national depressions and have always subsequently profited thereby. There is no reason why this depression should prove the exception.' "

West Virginia Pulp and Paper Company

230 Park Avenue, New York 35 East Wacker Drive, Chicago
503 Market St., San Francisco, Cal. Public Ledger Building, Philadelphia, Pa.



Mills of West Virginia Pulp & Paper Company

MANUFACTURERS OF

Supercalendered and Machine Finished

BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card

HIGH GRADE COATED BOOK

and Label Papers

KRAFT WRAPPING AND KRAFT ENVELOPE

also

BLEACHED SPRUCE SULPHITE PULP, SODA AND KRAFT PULP

DAILY CAPACITY
OVER 1400 TONS OF PULP AND PAPER

MILLS:

Mechanicsville ..... New York
Luke ..... Maryland
Covington ..... Virginia
Tyrone ..... Pennsylvania
Williamsburg ..... Pennsylvania
Cass ..... West Virginia

Secretary Boyce's Report

Charles W. Boyce, secretary of the American Paper and Pulp Association presented his annual report as follows:

The 56th year of the American Paper and Pulp Association's service to the industry has not been an easy one. Pressed by the exigencies of unprecedentedly low prices and of faltering sales, the demands for service have been unusually numerous. At the same time the Association has faced membership and financial difficulties.

In spite of reductions in membership payments and of resignations, the year's total income for Association work will amount to $45,149.00, if all dues are paid. At the beginning of the year, the Association budgeted its activities at $48,854.00. The difference between the budget and the expenditures amounting to $3,705.00 presented no difficult problem in financing in itself; but when piled upon the debts accumulated during former years, the problem became complicated indeed.

On April 1, 1932, the Association owed a total of $28,082.26, of which $7,500 was for bank loans, $13,406.25 to member companies for advances made in 1929 and in 1931, and a total of $7,176.01 chiefly to the Import Committee of the American Paper Industry in behalf of the industry's Tariff Committee of 1929 and 1930. Today the bank loan is reduced to $1,500.00 and provision has been made for the payment of this amount. Member loans have been reduced to $2,631.00, chiefly by cancellation on the part of the companies, and the amount owing the Import Committee on the tariff account is now the subject of negotiation. If means can be found of clearing this item, the Association will close the fiscal year with its indebtedness reduced to less than $3,000,000. Much of this may be credited upon dues for the next fiscal year.

The rapid reduction of the Association's indebtedness has been deliberately programmed and rigorously followed. The job is now nearly completed and the Association is once more in a position to carry on without the haunting difficulties of debt. The industry owes its thanks to the companies for their splendid action in cancelling all or large parts of their advances. The cash payments on debit accounts, which by March 31 will amount to $11,625.00 have come chiefly from the salary item of the budget. This necessitated reduction in the number of employees, part time furloughs, and extraordinary large reductions in the salaries.

Necessarily the Association's activities were programmed to fit the funds available. The established basis of operation was first reduced in August and in October another even more drastic curtailment was put into effect. After August no attempt was made to adhere to the budget; rather expenditures were cut to the resources that remained after cash payments upon debts had been made.

Yet in spite of inadequate funds, the Association's accomplishments during the year will by no means go down in history as the least of the 56 years of effort. In fact, all staff services have been maintained with the exception of the cost work, and some new activities were undertaken. I shall simply list some of our new activities without discussion. You will receive more complete reports at a later date.

The Association assisted materially in the preparation of the new book paper trade customs and in the organization of the book group. It worked with the Pulp and Paper Manufacturer's Buyers Group of the National Purchasing Agents Association in the revision of the pulp contract form. Quarterly surveys of pulp manufacturing costs were added to our regular list of activities. The Weekly Business Review was discontinued and in its stead a new publication, the Monthly Review, was started. During the year a survey of wood pulp inventories was made. Mill service in white water utilization was expanded on a fee basis and the character and scope of the information presented in the Monthly Statistical Summary, was considerably expanded.

In 1932 as perhaps in no other recent year, the Association was drawn into closer contact with the grade and group organizations in the industry. A working harmony between the industries cooperative agencies is of vital importance in the maintaining of high standards of service and in broadening the benefits of cooperative work. A beginning was made in 1932 that will be rigorously pushed to bring about a welding of interests in problems that cut through the industry.

I have listed these activities so that you may know that in the necessary process of debt reduction we have not lost our forward movement. Before us in 1933 are bigger problems than we ordinarily are called upon to face. Many of them are national in scope, reaching back to every unit in the industry. The American Paper and Pulp Association is now prepared to do its part in their solution.

Technical Association

The Technical Association of the Pulp and Paper Industry carried out a lengthy and impressive program, being continually in session at the Pennsylvania Hotel four days, from Monday to Thursday inclusive. President Allen Abrams delivered his annual address as follows:

These are days in which people are returning to fundamental principles. So it is permissible to restate the simple and elementary fact that your officers are, after all, but servants of the Association, in duty bound to ascertain and interpret its wishes. But I would not have you imagine that these offices are heavy in honor and light in labor. Your Executive Committee is composed of busy men who have given valuable time and thought to the affairs of TAPPI, and I know that you will join me in expressing thanks to them. R. G. Macdonald, Secretary-Treasurer, has also worked earnestly for the betterment of this body and his efforts merit our appreciation. From his report you will note that the Association has passed successfully through a trying year and is in a strong position financially and with respect to membership.

Each presiding officer of TAPPI finds a unique occasion for service. My predecessor, Max Krimmel, made noteworthy use of this opportunity to set up a committee organization which is so well planned that it touches all the fields of activity in which we might wish to engage. But the very completeness of this arrangement has made it necessary to define clearly the duties of officers and committees; to establish standard methods, practices and specifications; and finally to set the organization into effective operation.

In all of these tasks I have had the able assistance of the Vice-President, Clark Heritage, upon whom rests much of the responsibility for committee activity. Most of the important work of TAPPI is accomplished through committees and much of our progress is dependent upon their efforts. To the active division and committee chairmen, and to the faithful committeemen, I extend thanks for their good offices. We are too prone to overlook the advances that they are constantly bringing to pass but let me add that this work has its reward, even if judged from a selfish viewpoint only.

Publications

In connection with committee and general Association

PULP

PERKINS - GOODWIN CO.

Established 1846

551 FIFTH AVENUE, NEW YORK

TELEPHONE: VANDERBILT 3-2800

PAPER

activities it has become apparent that important and related information should be assembled and distributed to members at proper intervals. Consequently the past year marked the publication of the first TAPPI Yearbook, wherein you will find facts concerning your organization. Another forthcoming publication of even greater importance is the book, TAPPI Standards, which will contain the accepted methods of testing, approved practices and specifications of the Association. For the time being this manual will be in loose-leaf form to provide for the inclusion of new standards and other necessary changes as they issue through committee activity. This book will fill a definite need in the industry and its statements will have authority.

Meetings

Another phase of the Association to which the officers have given especial attention has to do with meetings. The increasingly diversified interests of our membership have required more group gatherings and necessitated a longer period for the Annual Meeting in New York. Greater care has been used in the selection of speakers and more emphasis has been placed upon the fact that it is a privilege to present a paper before TAPPI. Authors have been asked to study the delivery of their subjects and to exercise courtesy by staying within their time limits. This allows sufficient opportunity for discussion and creates interest in the meetings.

Last September we gathered for our Fall Meeting in Holyoke, at the invitation of the TAPPI members and the paper mills in that district. Under the able direction of Helen Kiely and her committees we had a program of education, mill visits and entertainment that was thoroughly enjoyed by the large number of people who attended.

This fall we hope to meet somewhere in the Middle West so that members may have an opportunity to visit the Chicago Century of Progress. This exposition deserves our support because its principal theme is the relation of science to the progress of the past century; and because it has gone forward confidently to a successful conclusion despite the depression. TAPPI has cooperated actively in the preparation of the paper exhibit but the response from our industry should have been more generous.

Sections

There are now four active branches of TAPPI and a fifth one is in progress of formation. It has been our policy to allow groups of members to solicit a charter rather than for us to seek new sections—a principle which should result in sound, healthy growth. The Pacific Section, under the leadership of Ralph Hansen, has done excellent work despite its geographical separation from the remainder of TAPPI, and even though its membership is widely scattered. The Delaware Valley Section, headed by W. R. Maull, is our newest branch but it has succeeded remarkably well. The Kalamazoo Valley Section, of which Harry Bradford is chairman, is in an important paper making district and therefore has considerable influence. The Lake States Section owes much of its continued interest and growth to Otto Kress, and to the present chairman, R. J. LeRoux.

From the desire of section and committee officers to discuss problems relating to TAPPI there has grown up an unofficial body known as the TAPPI Council. This group is composed of the officers and Executive Committee of TAPPI; chairmen of the various sections; division chairmen. The Council gathers for dinner and discussion one evening during both the Annual and Fall meetings Matters of policy are discussed and plans for the coming half year are worked out. We had an unusually successful Council assembly last September at Holyoke and we are to have another during the present meeting.

Now I should like to turn briefly to matters of broader importance to you and to your Association.

We have been going through three years of drastic adjustment, and without question the past year will go down as one unparalleled in history. We have witnessed a depression which has spread itself over the face of the earth; have seen people unemployed, unclothed and unwarmed while materials abound and factories lie idle for want of orders. Granaries are bursting and it scarcely pays the farmer to market his products; yet countless numbers of people are on the verge of starvation while farms have been kept from the mortgagors only by determined force. Investments have shrunk; in many cases to the vanishing point, and bank closings have been nation-wide. Many manufacturers are no longer concerned with selling at a profit but are out to get what they can. Foreign governments have undergone drastic changes and our own country has passed through its greatest political revolution.

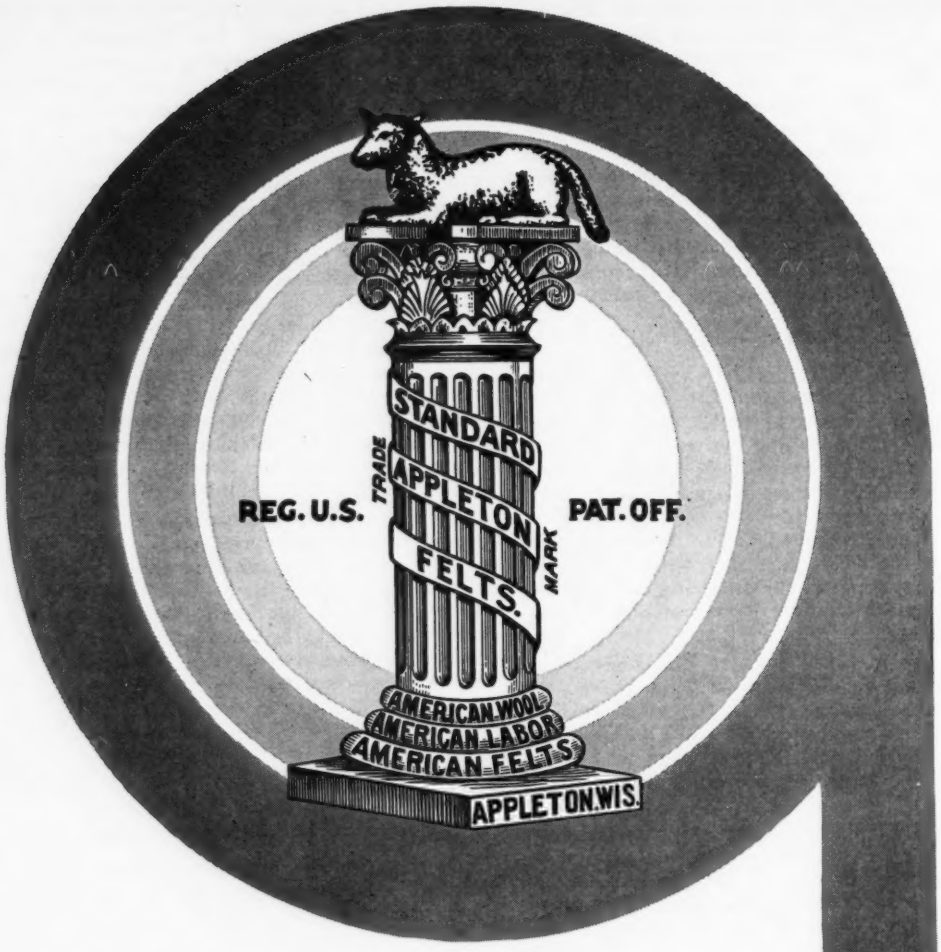
Recently we have heard much of technocracy—a word and movement which have actually been in existence for over a decade. It is unfortunate that premature publicity and overzealous press agents should have brought the subject into disrepute. Actually there has been an enormous amount of painstaking investigation and there is much of value to be learned from this research. While we may not see the dollar replaced by the erg as a medium of exchange, the latter can certainly be recommended for its greater constancy. At this meeting we are to hear from a man who has been closely associated with these studies and who can interpret them properly in relation to our national life.

Something Out of Step

Reflecting on the conditions which now confront us there can be no doubt but that something is out of step in our present day civilization. You have but to scan the recent report made to President Hoover by the Rockefeller Foundation Committee and you will find this underlying note. In the past two decades we have witnessed profound changes brought about by technology. Perhaps we have been like children bewildered with too many tempting delicacies; and like children, we have indulged ourselves into a good case of technological stomach-ache. In fact we have swallowed these new developments so rapidly that we need an opportunity to assimilate them more thoroughly. If this statement sounds extreme, consider the subtle yet potent effect of the movies in molding the minds of our young people, the diversion of the automobile to the gangster, the strident notes of the radio in otherwise peaceful homes. Technical progress is here to stay but it has so far out-stripped our social and economic advance that there must be a better balance and closer harmony if we are to build for permanent prosperity.

The late H. H. Dow divided the technical age into three periods. He showed that the steam engine ushered in the use of power; and that interchangeable parts then made possible mass production. He said that the third period would be based upon the use of automatic control in producing automatic operation. If we are to judge by the increased employment of the robot, the photo-electric cell, the thermostat and similar inventions his prediction is coming true. Who can estimate the distance we may travel along this road, if we but watch our step?

It is always well to keep in mind the inexorable manner in which these developments may function. For example you are aware that, even in times of maximum consumption, our industry has 25% excess capacity; and in times



Appleton Felts today meet all operating conditions, because they have kept pace with changes and progress in paper making. That's why after 42 years Appleton Felts are standard for quality and service. Made for the definite requirements of the customer, they continue to safeguard the quality of your product.

They are the best felts that can be made from pure high grade wool in a plant where every operation is subjected to critical supervision and rechecking—and backed by accumulated experience. Let us tell you what this means toward a solution of your felt problems.

APPLETON WOOLEN MILLS

Appleton, Wisconsin

Appleton

Felts and Jackets

like this the average mill is operating on a 50% basis. However let some cheaper source of wood be utilized or let some better method of pulping be worked out. You and I may protest that the building of more mills in the favored locality is an economic fallacy and yet there are few chambers of commerce which will view the affair in a purely altruistic light.

Now I have summarized facts of which you are fully aware. It is not my intention to paint a gloomy picture because I am thoroughly convinced of the essential soundness of this country. We have gone through these depressions before and we shall emerge safely from this one. However it becomes apparent that our own organization has definite responsibilities ahead and to these we should devote our thoughts and energies.

If we are to have the right kind of future leaders in our industry we must encourage and advise young men who wish to enter our ranks. This means that they should have a training well balanced as to theory and practice, similar to that offered at the Institute of Paper Chemistry and at the pulp and paper making schools of New York State University and the University of Maine. The operating man should have an opportunity for further study. The more we can promote better understanding between men of different training and experience, the better it will be for us all.

We should continue to encourage fundamental and applied research such as that being carried on at the Forest Products Laboratory and at the Bureau of Standards. Our fellowship activities have produced some fine results and should stimulate additional investigations. While we appreciate the necessity of reducing government budgets yet we should see that the pulp and paper appropriation is not reduced beyond its due proportion.

Insofar as possible we should exchange information which is not confidential and which can be used to benefit the industry as a whole. The competition of tomorrow will be increasingly between industries, and the one which has best working cooperation within its own ranks is the one which will come out on top. One important field which lies before us is the development and acceptance of methods and specifications which will become valuable guides in pulp and paper mill operation. Another field is in the matter of public relations where it becomes necessary at times to give sound counsel on matters coming within our province and which are of interest to the general public.

We must appreciate the fact that we can no longer be concerned simply with the creation of new technical ideas and processes but that we must consider their relation to the economic welfare of our industry. If we are to go ahead in technical matters then we must lend our support to the improvement of certain laws and practices which have outlived their usefulness in business of today and which hamper its progress.

These are some of the matters that lie before us, and of necessity I have been able to touch upon them only briefly. TAPPI has already engaged in some of these activities and will gladly accept its share of responsibility in these different fields. In the years ahead there is an opportunity for still greater service, and I want to pledge to our industry the continuing loyal support of this organization.

The officers of the Technical Association of the Pulp and Paper Industry are as follows:

President, Allen Abrams, Marathon Paper Mills Company, Rothschild, Wis.; Vice-President, C. C. Heritage, Oxford Paper Company, Rumford, Me.; Secretary-Treasurer, R. G. Macdonald, 370 Lexington avenue, New York.

Executive Committee: Allen Abrams, Chairman; C. C. Heritage, W. R. Maull, Dill & Collins, Inc., Philadelphia, Pa.; H. R. Murdock, Champion Fibre Company, Canton, N. C.; R. A. Hayward, Kalamazoo Vegetable Parchment Paper Company, Parchment, Mich.; W. S. Kidd, E. B. Eddy Company, Ltd., Hull, Que.; B. T. Larrabee, Pulp Division, Wyerhaeuser Timber Company, Longview, Wash.; G. N. Collins, International Paper Company, New York; E. O. Reed, Crane & Co., Dalton, Mass.; Otto Kress, Institute of Paper Chemistry, Appleton, Wis.; J. F. Rhoades, Mead Corporation, Chillicothe, Ohio; R. G. Macdonald, New York.

Secretary Macdonald's Report

R. G. Macdonald, secretary of the Technical Association of the Pulp and Paper Industry presented his annual report as follows:

The Technical Association of the Pulp and Paper Industry devoted 1932 to a program of internal development and improvement and extension of services to its members.

Membership

In 1932 there were 101 new members elected and 204 resigned or were dropped from membership. On December 31, 1932 the total individual membership was 1093. There was one corporate member added and five companies became contributing members. The corporate membership was 69 and the contributing membership was 34.

Necrology

The association regrets that it has lost through death the following members: S. W. Wiley, A. E. Trudo, J. C. Cunningham, L. E. Jonte and A. C. Skjenneberg.

Company Members

The corporate members that joined the Technical Association in 1932 were the Finnish Paper Mills Association. The contributing members that joined the Technical Association in 1932 were: Standard Oil Company of Indiana, Dodge Manufacturing Corporation, Pennsylvania Salt Manufacturing Company, Bausch & Lomb Optical Company, Ross Industries Inc.

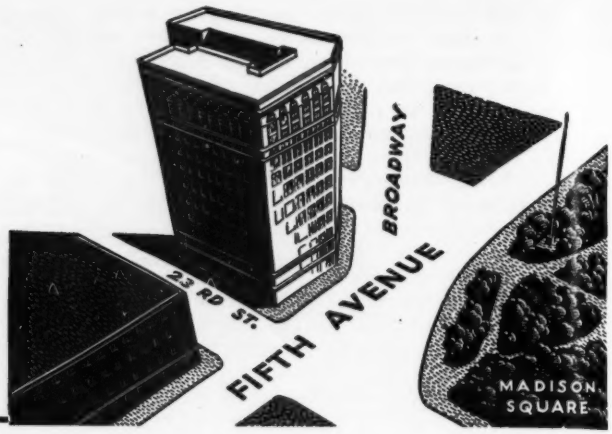
Special Reports

Since the association acts as a clearing house for information a large number of inquiries are received each year. Most of these are taken care of by the Secretary and committee chairmen. When, however, the answer to the inquiry depends on the opinion of a considerable number of individuals it is circularized throughout the membership and the replies are used to compile a special report on the subject which is sent to all who furnish information and to the corporate members.

Following are the titles of the Special Reports issued in 1932:

No. 167, Stock Chests and Agitation
168, Felt Life and Anti-Friction Bearings
169, Use of Starch in Calendering
170, Wire Backing and Covering for Cylinder Molds
171, Standard Humidity Conditions for Paper Testing
172, Foam and Foam Killers
173, Warping of Coated Paperboard
174, Use of Starch in Stuff Preparation
175, Riffler Design
176, Use of Starch in Beating
177, Sanding of Coating Calenders
178, Surface Sizing of Paper
179, Effect of Felts on Paper Finish
180, Cleaning Cylinder Paper Machine
181, Progress Report on Application of Chrome Nickel Iron Alloys in the Canadian Sulphite Pulp Industry

The Fifth Avenue Building



WHERE BUYERS COME TO BUY

Those farsighted concerns which have established New York headquarters in The Fifth Avenue Building enjoy the prestige of an address that commands confidence and respect everywhere. Located at the crossing of busy Broadway and fashionable Fifth Avenue at Madison Square, The Fifth Avenue Building lies in the heart of an international market. Here come buyers from the four corners of the globe for every type of merchandise. The South American rubs shoulders with the turbaned buyer from Calcutta; the Canadian and the South African are carried from floor to floor by the same efficient elevator service. Truly, The Fifth Avenue Building is a World's Fair of the leading industries.

Here are names famous the world over—paper and pulp manufacturers, paper merchants, paper mill agents, paper mill supplies, paper and pulp engineers, paper box board and paper products manufacturers. Also located in The Fifth Avenue Building are leaders in stationery, greeting cards, gifts, novelties, electrical goods, housefurnishings, office equipment, china, glass, toys and many others. Here buyers can place orders for the entire season without leaving the building, serviced by every convenience that a modern office building affords.

You will find it to your advantage to consider office and showroom space in The Fifth Avenue Building. Here you will be located half-way between the financial and shopping districts. Buses and surface cars pass the doors. Subway entrance in the building. Ten minutes from the Pennsylvania Station; thirteen from Grand Central. Smart new restaurant on the ground floor. Information booth in the lobby. On your next visit to New York why not ask us about space—and let us show you through the building?

The FIFTH AVENUE BUILDING

Broadway and Fifth Avenue at Madison Square, New York

"MORE THAN AN OFFICE BUILDING"

182, Evaluation of Paperboard Drier Performance
183, Pulp Use Requirements
184, Clay Preparation and Retention
185, Repairing Cracked Granite Rolls

Fall Meeting

The fall meeting of the Technical Association was held at Holyoke, Massachusetts, on September 14-16, 1932. About 360 attended. The local committee under the capable chairmanship of Miss Helen U. Kiely provided an excellent program and were rewarded by having the largest attendance on record for an association fall meeting.

Articles of Organization

At the annual meeting in February the Articles of Organization changes as proposed at the fall meeting in Kalamazoo, Michigan, were adopted.

Employment

A considerable proportion of the Secretary's time was devoted during the year to assisting members in obtaining employment. There are a number of very competent members unemployed at present. All members should assist in keeping our membership employed by notifying the Secretary whenever a vacancy exists.

Publications

The PAPER TRADE JOURNAL continues to be the official publication medium of the association. In spite of reduced income from advertising this publication continued to contribute twelve pages weekly to the exclusive use of the Technical Association. The association is indebted to George S. Macdonald, publisher, and Henry J. Berger, editor, of the PAPER TRADE JOURNAL, for their untiring cooperation with the Technical Association in its publishing activities.

Preprints of papers presented at the annual and fall meetings were prepared and contributed by the Lockwood Trade Journal Company, who also contributed $500 toward the publication of Technical Association Papers, Series XV. The cover stock of the Papers was contributed by the Bogalusa Paper Company.

In December the association issued its Year Book for 1932, the first volume of its kind that has been published. The Year Book contains the Articles of Organization, proposed code of ethics, general statistical information, section reports, personnel of divisions, list of members, regulations governing committees, standards and manuscripts, list of special reports, and the contents of Technical Association Papers.

The Bibliography and Patent Review of 1931 was issued as a separate publication early in 1932. The policy of issuing annual bibliographies will be continued.

Work on the preparation of a loose leaf manual of standard testing methods, recommended practices and specifications was begun. This will be issued early in 1933.

Cooperative Activities

The Technical Association continued to finance a fellowship at the Forest Products Laboratory, Madison, Wisconsin. Although the fellowship terminated in June, 1932, an additional contribution was made to complete certain phases of the work and to finance an investigation into the relative merits of the sheet making machines on the market.

The association made a financial contribution to the Institute of Paper Chemistry, Appleton, Wisconsin.

The association is represented in the A. S. T. M. on committee A-10 on iron-chromium, iron-chromium-nickel and related alloys by J. D. Miller, of the York Haven Paper Company; C. E. Libby of the New York State College of Forestry represents the association on committee D-8 on bituminous waterproofing and roofing materials.

The association is represented on the joint committee on approved pulp testing chemists, the joint education committee and the joint textbook committee.

Sections

The Delaware Valley Section had a successful year. Meetings were held about once a month at the Engineers Club in Philadelphia. The officers elected in 1932 were W. R. Maull, chairman; G. E. Landt, vice chairman; and H. P. Cannon, secretary-treasurer..

The Pacific Section held two meetings. In April the meeting was held at Portland, Oregon and in October it was held at Seattle, Washington, at which time the following officers were elected: R. B. Hansen, chairman; R. J. Schadt, vice chairman; and A. S. Quinn, secretary-treasurer.

The Lake States Section held monthly meetings that were extremely well attended, all meetings being held at the Conway Hotel in Appleton, Wisconsin. In May the following officers were elected: R. J. Le Roux, chairman; Otto Kress, vice chairman; and A. T. Gardner, secretary-treasurer.

The Kalamazoo Valley Section held a number of meetings in Kalamazoo. In October the following officers were elected: H. C. Bradford, chairman; C. C. Schneider, vice chairman; and R. B. Barton, secretary-treasurer.

In December a number of members met at the Nonotuck Hotel in Holyoke, Masssachusetts to organize a local section. The proposed organization is to be known as the New England Section and has elected the following provisional officers: F. C. Clark, chairman; F. A. Curtis, vice chairman; Helen U. Kiely, secretary; and W. O. Johnson, treasurer.

Divisions and Committees

Further efforts were made to strengthen the divisional organization of the association. The field of activity of each committee was carefully defined and a number of new committees were formed to meet the needs of the membership.

In the Management Division a History and Biography Committee was formed under the chairmanship of R. M. Snell.

The Education Committee completed its survey of the paper industry in cooperation with the Federal Board of Vocational Education. This survey will be published in 1933.

The Management Methods Committee chairmanship was transferred from L. C. Reynolds to W. M. Shoemaker.

The Engineering Division chairmanship was transferred from W. G. MacNaughton to E. F. Bearce.

Frederick Wierk succeeded E. F. Bearce as chairman of the Equipment Committee.

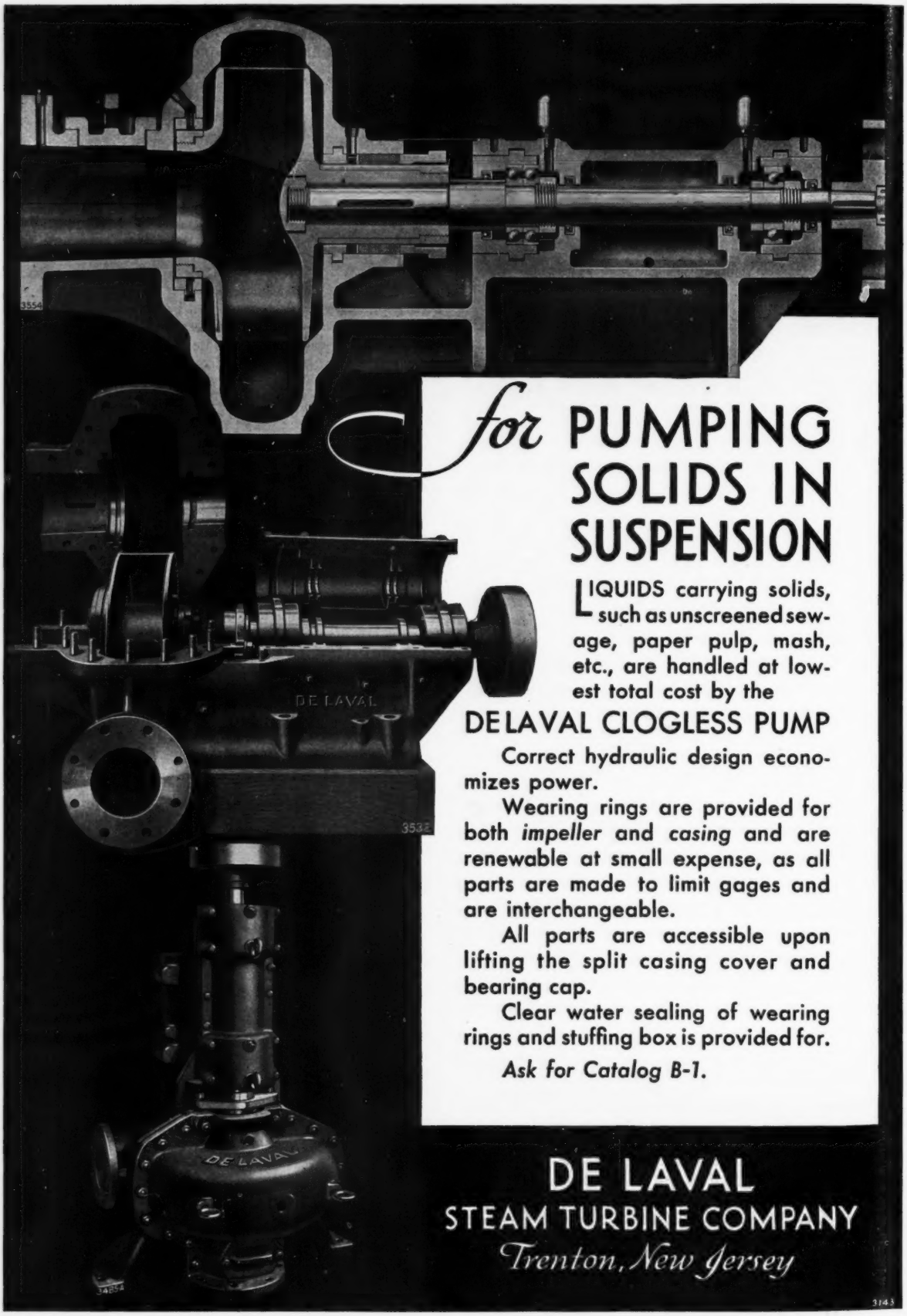
The Materials of Construction Committee under the chairmanship of J. D. Miller presented the association's first tentative specification at the Holyoke meeting. This deals with chromium-nickel-iron castings for the sulphite pulping process.

In the Raw Materials Division a sub-committee on chemical pulp specifications with Helen U. Kiely as chairman was formed. This sub-committee is part of the Fibrous Raw Materials Committee and it conducted a symposium on pulp specifications at the Holyoke meeting.

In the Operating Division there were a number of committee changes.

C. J. Christiansen became chairman of the Preparation of Fibrous Materials Committee replacing C. A. Blodgett.

W. J. Garding replaced J. H. Slater as chairman of the Mechanical Pulping Committee.



for PUMPING SOLIDS IN SUSPENSION

LIQUIDS carrying solids, such as unscreened sewage, paper pulp, mash, etc., are handled at lowest total cost by the

DE LAVAL CLOGLESS PUMP

Correct hydraulic design economizes power.

Wearing rings are provided for both *impeller* and *casing* and are renewable at small expense, as all parts are made to limit gages and are interchangeable.

All parts are accessible upon lifting the split casing cover and bearing cap.

Clear water sealing of wearing rings and stuffing box is provided for.

Ask for Catalog B-1.

DE LAVAL
STEAM TURBINE COMPANY
Trenton, New Jersey

H. R. Murdock replaced E. S. Hinman as chairman of the Alkaline Pulping Committee.

Vance P. Edwardes succeeded L. E. Jonte (deceased) as chairman of the Acid Pulping Committee.

James Coghill replaced E. G. Ham as chairman of the Stuff Preparation Committee.

Lyman Smith replaced L. M. Yoerg as chairman of the Paper Manufacture Committee.

The Finishing, Processing and Converting Committee was discontinued and replaced by the Finishing Committee with H. R. Harrigan as chairman.

In the Testing Division M. A. Youtz replaced W. H. Monsson as chairman of the Fibrous Materials Testing Committee.

All the committees in the Testing Division presented tentative standard methods to the association, of which several were adopted as official methods.

In the Research and Development Division the Permanence and Durability Committee was made a sub-committee of the Paper Use Requirements Committee and a new committee to be known as the Fundamental Research Committee was formed under the chairmanship of Harry F. Lewis.

A new Converting and Consuming Division was formed consisting of the following committees: Coating Committee with J. J. O'Connor, chairman Laminating Committee with E. C. Lathrop, chairman; Container Committee with Pierre Drewsen, chairman; and Graphic Arts Committee with Charles Clarkson, chairman.

As Awards Committee consisting of G. E. Williamson, R. S. Kellogg, and J. D. Rue, was appointed to assist the Executive Committee in considering candidates for honorable mention.

At the fall meeting at Holyoke, a meeting of committee and divisional chairmen was held to discuss association objectives. It is planned to have a similar meeting at each convention. The influence of these meetings is already apparent in the quality of committee work and convention programs.

Acknowledgement

The Secretary would be amiss to neglect to express his gratitude to the many members who have directly assisted him in his work during the past year, which has been a difficult one in many respects. The wholehearted and genuine willingness of members to cooperate for the good of the association largely accounts for the great advances that the association has made in the face of the greatest depression our industry has known. An improvement in general conditions will no doubt be productive by the greatest growth and progress in the association.

National Paper Trade Association

Sidney L. Wellhouse, of the National Paper Company, Atlanta, Ga., was elected president of the National Paper Trade Association of the United States at the Thirtieth Annual Convention of the association, held at the Hotel Pennsylvania, Monday, Tuesday and Wednesday of this week. The other officers elected were as follows:

Vice-President in Charge of Wrapping Paper Division, Harold Zellerbach, Zellerbach Paper Company; Vice-President in Charge of Fine Paper Division, A. W. Leslie, The John Leslie Paper Company, Minneapolis, Minn.; Treasurer, Charles Addoms, Miller & Wright Paper Company, New York City; Executive Secretary, A. H. Chamberlain, 420 Lexington avenue, New York; Assistant Secretary, C. A. Spaulding, 660 32nd street, Des Moines, Iowa.

J. F. Miller, president, in his annual address, said in part:

"Many mills have taken strong upstanding positions in regard to their agents who handle their lines giving them protection in certain territories so that the stocking merchant can get the resale prices without any trouble. I wish all mills would carry this to the same conclusion, and today I believe that the mill realizes more than ever, and the merchant more than ever, that for a successful return to each, they must work in the closest co-operation. The mill must be interested in the financial condition of their agents and their agents must work closer with the mills and give these mills all they possibly can and not spread their lines so thin that it makes it profitable for neither. Through this co-operation the mill and the merchants will ultimately reach the highest ideal.

"We have intensive activities today which no doubt you have heard much about and have listened to reports of more shortcomings which must be corrected, and we believe we have the proper committee heading these subjects that will bring them to successful conclusions. I refer to the Committee for Cost Finding. I believe this is very important for all of us, because when we know what our actual costs are, we will be more conscious of what the selling prices should be in order to turn us over a profit. Another very important committee is for the elimination of direct selling —this I believe will be ultimately corrected to a large extent by the committee handling this matter.

"Then let me suggest that after all the hard work that this association has done for thirty years, that you individually make a solemn resolve at this time to believe more in the National association, to co-operate more with your competitors, to give a little more of your time to help bring about the activities that are now planned so that in the near future we will have arrived at a point where we know that all the money we have spent in our association work has been an investment from which we have received many dividends."

Import Committee

Ten years ago, at the 46th Annual Convention of the American Paper and Pulp Association, there were discussions of the unfair competition in the American market of foreign made papers. Nine years ago, at the 47th Annual Convention, the Salesmen's Association of the Paper Industry adopted resolutions urging the formation of an organization to combat this unfair foreign competition by the utilization of all the resources of existing law. In 1933, at the 56th Annual Convention of the American Paper and Pulp Association, the Import Committee of the American Paper Industry, the organization formed as a result of these efforts beginning ten years ago, can report that in the last nine years over $40,000,000 worth of paper, formerly bought abroad, has been diverted to the American mills.

This is an average of $5,000,000 in business a year which has resulted from this organization's efforts to increase the use of American made paper, instead of paper made in foreign mills.

The Import Committee of the American Paper Industry is proud of its record of accomplishment, for its activities have resulted in action in over 8,000 cases of separate importation, which were believed to involve under-valuation, misclassification or dumping of foreign papers. Thousands of these cases went to the United States Customs Court for trial, and court decisions upheld the contentions of the Import Committee in more than 80 per cent of all the cases tried in that court. Over 1,000 cases are still pending in the courts awaiting trial, involving importations at Atlantic Coast, Pacific Coast and Gulf ports, as well as shipments to inland cities. During the year just closed, over 90 per cent of the cases decided by Government officials were adverse to the importing interests.

Of the cases now pending, the most important involve alleged violation of the Anti-Dumping Act as to Scandi-

When you write

● Even such a routine activity as writing can be related to our business here at American Cyanamid & Chemical Corporation; for the products we make and sell are so varied that they reach into almost every industrial field, and from there into an incredible number of the simple commodities used in daily living. In *your* industry, our products have a specific place; and because of this "breadth" of our interests, we can serve you intelligently and thoroughly.

AMERICAN CYANAMID & CHEMICAL CORPORATION

535 FIFTH AVENUE · NEW YORK

navian sulphite and kraft wrapping papers, undervaluation or dumping of European glassine papers, but the thousand pending cases include papers of all grades.

The methods of the Import Committee are well known to the paper industry, and need only be explained by the statement that through this organization the paper industry has placed all of its technical, marketing and laboratory resources at the disposal of the Government, so that the officials of the Customs Bureau can have all possible assistance in their efforts to strictly enforce and construe the existing tariff laws.

Because the depression of business intensifies competition, it is in such periods as the present that the work of the Import Committee is most important, for it is at such times that the most strenuous efforts are made by foreign interests to supply the American market to the detriment of the American mills. To give the American mills an equal opportunity with the foreigners for the home market is the objective of the Import Committee.

Fibrous Raw Materials Meeting

Papers of more than usual interest and importance were presented at the joint meeting of the Raw Materials Division of the Technical Association of the Pulp and Paper Industry and the Pulpwood Committee of the American Paper and Pulp Association, held on Monday at the Hotel Pennsylvania. The following program was carried out:

"Pulpwood Holdings, A Company Asset," George N. Ostrander, Finch, Pruyn & Co., Inc., chairman, American Paper and Pulp Association Pulpwood Committee.

"Report Fibrous Raw Materials Committee of TAPPI," John Traquair, The Mead Corporation.

"The Cameron-Dockery Proposal for Utilization of the Whole Cotton Plant as a Source of Cellulose for Papermaking," Dr. H. R. Murdock, Champion Fibre Company.

"Variations in Yield and Quality of Sulphite pulp Made of Spruce from Different Regions," Bjarne Johnsen and Charles H. Reese, Hammermill Paper Company.

"Modernizing Pulpwood Operations," Alex Koroleff, Woodlands Section, Canadian Pulp and Paper Association.

"Transportation and Mill Handling of Pulpwood," George D. Bearce, International Paper Company.

"Pulp Manufacturing Efficiencies," J. A. C. Kavanagh, American Paper and Pulp Association.

Glazed and Fancy Paper Association

Meetings of the Glazed and Fancy Paper Association will be held today (Thursday) and Friday at the Advertising Club, 23 Park avenue, New York. The schedule follows:

Executive Committee, Thursday afternoon 2:30; Manufacturers Division, Friday, 9:30 a.m.; Luncheon, Manufacturers and Distributors Division, 12 Noon Friday, followed by meeting.

President John McLaurin, of the McLaurin-Jones Company, will preside at the executive committee meeting and at the joint divisional meeting. Vice-President F. V. Friedlander, of the C. R. Whiting Company, will preside at the manufacturers division meeting.

Pulp and Paper Buyers Group

At a meeting on Wednesday of the Pulp and Paper Manufacturers Buyers' Group of the National Association of Purchasing Agents, at which Harry Bradford, of the Rex Paper Company, Kalamazoo, Mich., presided as a chairman, a discussion on a standard contract with importers of pulp was held.

George W. Browne, of the A. P. W. Paper Company, Albany, N. Y., and Mr. Bradford conducted a discussion on Felts and Wires. A paper entitled "Casein Specifications" was presented by Mr. Bradford; and L. C. Reynolds, comptroller of the American Writing Paper Company, Inc., Holyoke, Mass., presented a paper on "Price Trends Since the Civil War."

Cover Paper Manufacturers

At the annual meeting of the Cover Paper Manufacturers Association held on Tuesday, February 14, at the Hotel Pennsylvania, the following officers were elected:

President, R. S. Madden, American Writing Paper Company, Inc., Holyoke, Mass.; Vice-President, J. B. Shepherd, Peninsular Paper Company, Ypsilanti, Mich., Secretary-Treasurer, E. H. Naylor, 95 State street, Springfield, Mass.; Assistant Secretary, M. C. Dobrow, 95 State street, Springfield, Mass.

Members of Executitve Committee: R. S. Madden, J. B. Shepherd and Willis H. Howes, Beckett Paper Company, Hamilton, Ohio.

Wrapping Paper Manufacturers

John R. Diggs, vice president of the Albemarle Paper Manufacturing Company, Richmond, Va., has been chosen to continue the constructive work of co-operation in the kraft industry following the dissolution of the Kraft Institute at a meeting in Chicago on January 20. Oliver M. Porter, former secretary of the Kraft Institute, will assist Mr. Diggs in the work that the kraft industry is doing to bring about better conditions in the industry.

Paper Makers Advertising Club

The Paper Makers Advertising Club at its luncheon on Wednesday February 15, at the Hotel Pennsylvania, elected the following officers:

President, Etson S. Dunbar, Crocker-McElwain Company, Holyoke, Mass.; Vice-President, William S. Fowler, Hampden Glazed Paper and Card Company, Holyoke, Mass.; Secretary, Alexander Forbes, American Writing Paper Company, Inc., Holyoke, Mass.; Treasurer, Orin Summerville, Beckett Paper Company, Hamilton, Ohio.

Bristol Board Manufacturers

Fifteen bristol board manufacturers held a conference at the Hotel Pennsylvania, New York, on Tuesday with Norman Harrower of Linton Bros. & Co., Fitchburg, Mass., presiding. The group adopted revised index bristol and revised mill bristol trade customs and also adopted new practices in respect to cutting charges and skid packing.

Glassine Division

The Glassine Division of the American Paper and Pulp Association held a delightful luncheon Wednesday at the Hotel Pennsylvania. J. L. Riegel was elected chairman of the meeting following. The question of depreciated currency was fully discussed, among other things, and after a general business session, the meeting was adjourned. Thomas J. Burke was renamed secretary of the Division.

Binders Board Association

The Binders Board Manufacturers Association held a luncheon in a private dining room on the Hotel Pennsylvania roof on Wednesday. Business problems of the industry were discussed. Officers of the organization were elected last December.

From these 9 OXFORD PAPERS

you can select the right quality and price to meet every requirement in these characters of papers.....

Glossy Coated Papers

1. Oxford Polar Superfine
2. Mainefold
3. White Seal

Dull Coated Papers

4. New Polar Dull
5. Oxford North Star Dull

Uncoated Papers

6. Carfax English Finish and Super
7. Oxford English Finish and Super
8. Swift River English Finish and Super
9. Oxford Antique Wove

Ask Your Oxford Merchant for New Sample Book

OXFORD PAPER COMPANY

Mills at

Rumford, Maine . . . . West Carrollton, Ohio

Executive Offices

230 Park Avenue, New York, N. Y.
35 East Wacker Drive, Chicago, Ill.

Pulp Operating Efficiencies

By John A. C. Kavanagh

The topic which I am asked to discuss is that of pulp operating efficiencies and the relation of changes in efficiencies to changing industrial conditions. Since the depression set in numerous changes have become quite marked and many have a pronounced significance. I would like to discuss very briefly some of the underlying trends in the pulp industry, covering production, cost, labor and yield as relates to the economic changes in the pulp industry.

Pulp Production Trends

Let us consider first the trend of domestic wood pulp production during the past few years—say since the 1929 peak of operations. In the banner year of the industry's history we produced about 4.9 million tons of wood pulp and imported about 1.9 million. At that time various basic changes were occuring in the relation of various grades of wood pulp to the total. Kraft pulp and bleached sulphite were gaining more importance by leaps and bounds and the production of bleached sulphite was gradually reaching a point where it almost equalled that of unbleached sulphite.

It is interesting to note the changes in the relative importance of the various grades because these trends are the hand writing on the wall—and indicate to those grades which are losing their relative importance that something drastic may have to be done. The steady decline of soda pulp as an important factor in book paper production illustrates the point. Soda pulp has been slipping ever since 1926 and during the past few years mills have been shutting down as a result of competitive factors.

The rapid growth of kraft pulp from 1928 has been one of the outstanding major trends. Not only has kraft pulp become a more important factor in competition with Sulphite and other pulps but it continued to increase in growth through 1930 and 1931, whereas all other grades reflected the depressed condition of business.

Another impressive change in trend is the growing importance of bleached sulphite. The domestic production ordinarily ran below the level of unbleached sulphite, but from 1930 to 1932 we find the production and domestic bleached sulphite running ahead of unbleached production.

While we depend to a large extent on foreign unbleached sulphite and as a matter of fact our imports in 1929 were 47 per cent of our consumption—1.6 million tons of unbleached sulphite was available, whereas the tonnage available for consumption in bleached ran 1.2 million. In 1932 bleached sulphite available for consumption was only 100,000 tons smaller than unbleached sulphite as against a difference of 400,000 tons in 1929, which indicates a closer competition in the consuming market. The keener the competition the closer costs will have to be watched.

Cost Trends

Decreases in wood costs have stimulated the competition between various regions in the United States—and have been a factor in reducing pulp costs and prices. In the case of mill conversion costs we find changes in these items but they are more uniform than the regional changes in wood costs.

Unbleached sulphite total average mill conversion costs in the North East increased from 1929 to 1930 and 1930 to 1931 although labor and chemical costs decreased. Steam and power costs, however, showed an upward tendency.

In the case of bleached sulphite average mill conversion costs showed a tendency to decrease from the 1929 level. Labor showed a steady decrease from year to year, but chemicals, steam and power fluctuated—1931 and 1932 were both below the level of 1929, but there was a small increase in costs between 1931 and 1932.

Kraft pulp mill average conversion costs in 1931-32 were sharply below the level of 1929 in both the South and Lake States. The labor costs were cut quite sharply in the Lake States as were steam and power. In the South labor costs and chemicals decreased sharply from 1929, but steam and power were above the level of 1929.

Each region has some particular items in its cost make up which can stand correcting—and which competition will force to be corrected in the long run.

Pulp and Paper

We have witnessed a tremendous growth in the per capita consumption of paper. Since 1921 the year of the last depression the consumption has grown from 112 pounds to 220 pounds in 1929. This per capita consumption growth has been somewhat misleading and had encouraged the installation of a large surplus paper capacity in the United States. Population growth such as the United States has experienced over the past century cannot go on indefinitely—and the market cannot go on expanding indefinitely after the rate of population growth ceases.

In the United States, authorities estimate that the rate of growth will be stabilized in about twenty to thirty years—at which time there will practically be a tie score between the rate of births and the rate of deaths. Such a condition exists in France today. In addition the make up of the population is changing rapidly, the younger generation are no longer the predominating portion of the population —and so there is a change in the nature of the demand.

The fact that it is probable that the paper market will not expand at the previous rate also indicates that competition will continue to grow keener and naturally every effort will be made to keep mills operating efficiently enough to meet this competition.

Efficiencies

I might point out briefly some of the interesting trends which our reports have disclosed during recent years. Let us consider some of the information which the technocrats find extremely interesting. Sulphite mills in 1929 showed an average for labor of 4 man-hours per ton of pulp, while for the current year the average is 3.2 a decrease of 20 per cent. In 1925 the labor per ton of pulp was almost 5 man-hours, and the decrease from that period is approximately 36 per cent. Between the periods of 1925 and 1929, the decrease was only 11 per cent in man hours per ton, indicating that the greatest reduction in the use of labor has occurred since the depression started.

In the case of sulphate pulp, the reduction in the man-hours per ton of pulp was even more drastic than in the case of sulphite. In 1925 sulphate mills used an average of 13.7 man-hours per ton, which decreased to 8.3 in 1928, a reduction of about 40 per cent. In 1929 man-hours per ton were approximately 7.5 and in 1932 5 man-hours per ton, a decrease in that period of 33 per cent.

The rapid increase in the efficient use of labor in kraft pulping, combined with the use of low cost pulpwood, accounts for the growth of the kraft industries. Greater efficiency was to be expected in the case of this industry because of the new and modern design of equipment.

* Delivered at joint meeting of the Technical Association of the Pulp and Paper Industry and the American Paper and Pulp Association, Paper Week, New York, Feb. 13-16, 1933.

Look down this Line-up of

LINDSAY

FOURDRINIER WIRES

L ong-crimp, with its
I ncreased Tonnage
N on-grooving,
D uo-Wear and
S piral Weave wires
A re made to meet
Y our individual needs.

The original Longcrimp Fourdrinier Wires were made ten years ago by this Company. Since then, these wires have set new standards for long service and large tonnage on Kraft, Newsprint, and other grades of paper.

Do you have trouble with scored seams and the consequent short life of wires? Our non-grooving and spiral weave wires are made to overcome this difficulty and are doing it.

Duo-wear represents the latest development in Fourdrinier Wire manufacture. These wires give extra service on all grades of paper. Some day you will use Duo-wear wires. Don't put it off; put the wires on. They will demonstrate their merit.

THE LINDSAY WIRE WEAVING CO.

14025 Aspinwall Ave. Cleveland, Ohio

There is another feature of the labor required in the production of pulp which is interesting. There is a wide spread between various mills in the amount of labor used per ton of pulp. During the past three years the low average for sulphite pulp was 1.9 man-hours per ton as against a high average of 4.5 man-hours per ton. In the case of sulphate or kraft pulp, the high average was 7.3 man-hours per ton and the low 2.9 man-hours. In both cases the wide spread between individual mills indicates plainly that the greatest efficiency has not yet been achieved.

General indications are that competition will be keener in the future and that the state of flux existing between the various competitive products will increase the need for an increasing amount of efficiency and cost reduction wherever there is an opportunity for improvement.

William W. McLaurin Passes On

[FROM OUR REGULAR CORRESPONDENT]

BROOKFIELD, Mass., February 13, 1933.—William W. McLaurin, president of the McLaurin-Jones Paper Company here, died Friday at his residence on Prospect street, aged 54, after an illness of about two weeks. During the World War his plant supplied the paper for the first Liberty bonds and, in fact, most of the paper used for the Liberty bonds. He introduced the process of manufacturing non-curling gummed paper. His factory made most of the gummed paper for airplanes during the World War.

Mr. McLaurin was born in Glasgow, Scotland. He was educated in Scotland and later at Hanover, Germany. After graduation from a university there, he studied practical paper making in Silesia, Germany, and in Lancaster, England. He then entered his father's business, Smith & McLaurin, Ltd., of Milliken Park, Scotland.

He came to this country in 1906, settling in Brookfield. He founded the Ideal Coated Paper Company, which later became the McLaurin-Jones Paper Company, with mills in Brookfield and Ware, Mass.

On June 3, 1911, he married Anny Heichemer, of Mainz, Germany, by whom he is survived, together with two daughters, Anny and Irene; five brothers and two sisters. Mr. McLaurin was prominent in Masonic orders in Warren, Worcester and Springfield, Mass.

Engineering Conference at Chicago

Plans for the huge conference of engineers at Chicago, during Engineering Week, June 25-30, sponsored by the Century of Progress Exposition, are making excellent progress. Engineers and superintendents of paper mills will be particularly interested in the sessions of the American Society of Mechanical Engineers, the American Society of Heating and Ventilating Engineers and the American Institute of Electrical Engineers. Some twenty of the national engineering societies will also participate with sectional and national meetings.

In addition to the many interesting educational exhibits at the Century of Progress Exposition engineers of the paper industry will also see much of value at the Sixth Midwest Engineering and Power Exposition, to be held at the Coliseum during that week. At this exposition some 300 manufacturers will show the latest developments in steam generating equipment for power and process purposes. In addition there will be a wide range of equipment such as ventilating and air conditioning equipment, pumps, water softeners, electrical apparatus, etc.

The combined membership of the engineering groups participating in Engineering Week is 91,600. Preliminary estimates of attendance indicate the largest gathering of engineers in history.

Brown Co.'s Unique Exhibit

The Brown Company, of Portland, Maine, has an unique exhibit at the Paper Trade Convention in the Pennsylvania Hotel, New York, this week. This exhibit includes samples of papers made from Solka, the product which is not only being used by the paper industry, but also by the textile industry and a various number of other industries as well to build extra quality into products made from it. The large rug manufacturers are using Solka and actual rugs made from this remarkable product are also on display.

The exhibit also includes samples of roofings made by some of America's largest roofing manufacturers into which Solka has been included to give these roofings extra quality which a few years ago was thought impossible. Solka roofings are almost untearable, practically puncture proof, have undue stress around nails, mould around the sharpest corners without breaking, and offer greater protection against wind and storm.

The Brown Company are also showing a various number of other products into which Solka goes to build quality. Then in another part of the exhibit are displayed papers from that unique new fibre of the Brown Company known as Cellate, which has the unusual characteristic of giving to papers the strength of No. 1 kraft and the appearance of a clear white bond.

International Envelope Corp. Busy

During the so-called "depression period," one of the best industries for Dayton, Ohio, is that of the International Envelope Corporation, which recently received the contract for supplying stamped envelopes and newspaper wrappers.

This contract, which will continue for a period of four years, is proving of special benefit to Dayton at this time as the envelope company is affording employment to many men and women. While the demand for stamped envelopes and wrappers has not been as large as formerly, there is a steady, consistent call for the product and much of the raw material is produced in Miami Valley towns.

This contract, as is well known, is the largest single supply award made by the Government. For the four-year period which ended in December the amount of the contract was $11,000,000. These figures may not be met during the ensuing quadrennium unless prosperity returns in full measure.

The contract for the four-year period is understood to have been taken at figures considerably below those prevailing up to December and the four-year term prior thereto.

Georgia Forestry Association to Meet

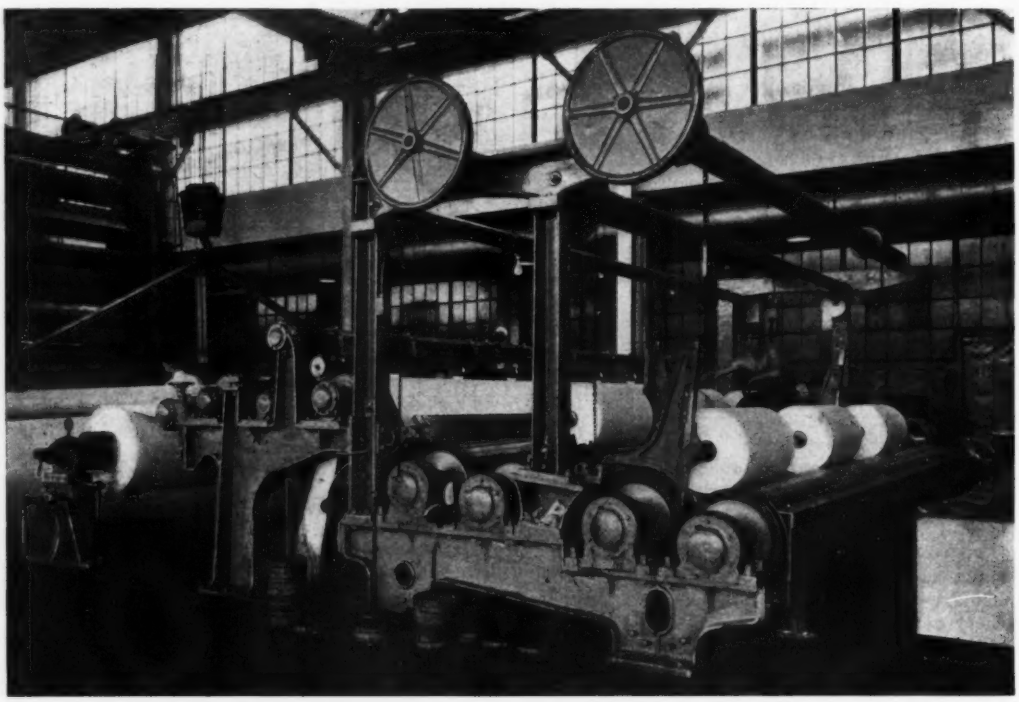
In order to conform to the wishes of many members of the paper industry, the dates of the annual meeting of the Georgia Forestry Association at Savannah have been advanced to May 1 and 2. The sailing date from New York City of the large group from the industry which will take part in that meeting and inspect the paper and pulp laboratory of the Georgia Department of Forestry and Geological Development has been advanced from May 12 to Friday afternoon, April 28, 1933.

Pulp Contract Revision Committee

The Pulp Contract Revision Committee of the American Paper and Pulp Association held a meeting on Tuesday at which a tentative pulp contract between importers and pulp and paper manufacturers was decided.

The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

HIGH SPEED FOUR-DRUM WINDER & SLITTER



MOORE & WHITE HIGH SPEED all ball bearing equipped four-drum winder & slitter with quick removable ***bottom*** slitter blades in mill of Champion Fibre Co., Canton, N. C.—236″ width of drums operating at a paper speed of 2100 feet per minute.

DESCRIPTIVE CATALOGUE
UPON REQUEST

Progress in the Production and Transmission of Heat and Power*

Annual Report of the Production and Transmission of Heat and Power Sub-Committee of the Heat and Power Committee of the Engineering Division of the Technical Association of the Pulp and Paper Industry

Manufacturers of equipment pertaining to the work coming under the scope of the sub-committee have contributed their reports or have signified they have nothing of interest to report. This opportunity is taken to express appreciation of their efforts and to acknowledge them with thanks. In so far as possible, the original material has been quoted verbatim, but in some cases, due either to lack of space or to the character of material, changes have been made which, it is hoped, have not detracted from the sense of the original material.

As the form of this report is something of an innovation for the association, the committee desire to receive expression of opinion as to the value of the report to the association and to the manufacturers making the contributions.

Each manufacturer's contribution speaks for itself, to a large extent, and as a great many subjects are treated, it is difficult to draw general conclusions. Some manufacturers have taken the opportunity made by decreased production to go carefully over their designs and methods in order to put the latest advancements into practice. Others have either found no improvements economical to make or from lack of resources, have not attempted to change their output. The majority of those reporting, have shown a keen appreciation of the problems involved and a strong desire to make their products suitable for the needs of industry.

Respectfully submitted for The Production and Transmission of Heat and Power Sub-Committee by R. R. Baker,[1] C. A. Cajanus,[2] K. B. Howell,[3] W. N. Polakov,[4] and A. G. Darling,[5] Chairman.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.

[1] Engineer, paper mill engineering, Westinghouse Elec. & Mfg. Company, E. Pittsburgh, Pa.

[2] Consulting engineer, Menasha, Wis.

[3] Mercon Regulator Company, Milwaukee, Wis.

[4] Consulting engineer, New York, N. Y.

[5] Industrial engineer, General Electric Company, Schenectady, N. Y.

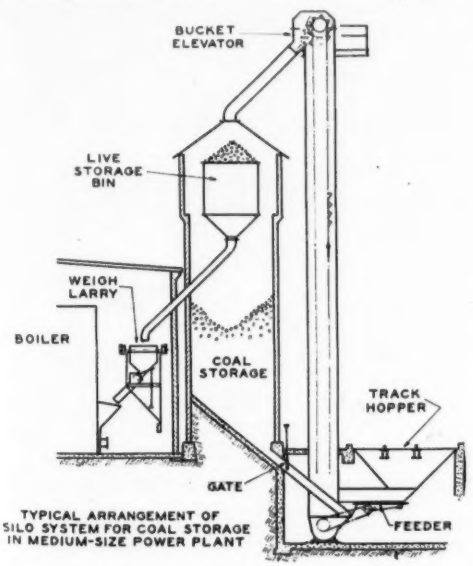


FIG. 1
Typical arrangement of Silo System for coal storage in medium size power plant. (Stephens-Adamson Mfg. Co.)

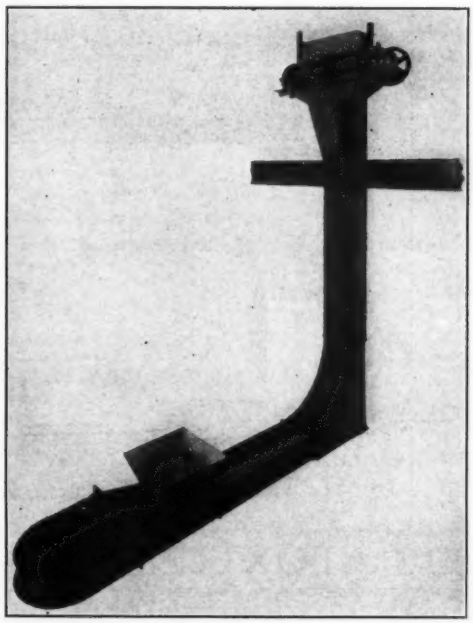


FIG. 2
Horizontal and vertical Redler conveyor discharging one into the other. (Stephens-Adamson Mfg. Co.)

I. Steam Generation

A. COAL FIRED PLANT.

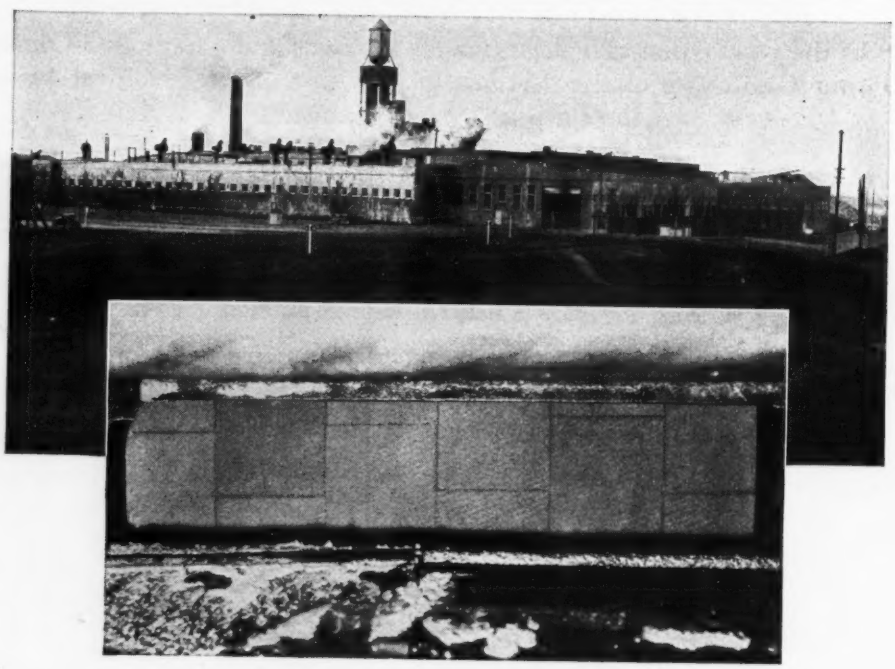
a. Coal storage, handling and crushing equipment.

Stephens-Adamson Mfg. Company

A silo type coal storage plant has been developed. Coal is received in hopper bottom cars, spotted over a track hopper and dumped. A feeder delivers the coal at a predetermined rate to an elevator, which discharges the coal to the live storage hopper at the top of the silo. A clear space is left between the sides of the hopper and the silo walls and when the hopper is filled and surcharged the coal spills over and into the reserve storage compartment below.

From the live storage bin coal flows by gravity through a chute to the stokers or to a weigh larry or conveyor feeding the stokers. At the bottom of the silo or reserve storage compartment is a chute leading to the elevator. When the live storage bin is empty a gate is opened, coal flows by gravity to the elevator boot and is lifted to the live storage bin. Adequate storage is provided within waterproof walls and dust, dirt and unsightly coal piles are eliminated. Expensive building alterations due to the selection of this type of equipment are very rarely, if ever, required.

SINCE 1929 IN CONTINUOUS SERVICE IN THE GREAT MILLS OF PRICE BROS. & COMPANY LTD.



THIS ALOXITE BRAND PULP GRINDING WHEEL
REG. U. S. PAT. OFF.

AFTER all is said and done, it is the proof of performance in such noted mills as Price Bros. & Company Ltd. at Kenogami, that indicates and emphasizes the success of Aloxite Brand Pulp Grinding Wheels.

In this great plant, this wheel is producing, in keeping with Price Bros. standards, a decidedly high quality pulp—effecting real economies in a high production of pulp at low wheel and grinding costs.

Tune in THE CARBORUNDUM BAND
Saturdays at 9.30 E.S.T. Columbia Chain

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.
REG. U. S. PAT. OFF.

CANADIAN CARBORUNDUM CO., LTD.
NIAGARA FALLS, ONT.

(CARBORUNDUM AND ALOXITE ARE REGISTERED TRADE MARKS OF THE CARBORUNDUM COMPANY)

The coal longest in storage is always drawn off first so that by designing to avoid dead pockets, the fire hazard is reduced to a minimum.

Silos can be constructed of various materials, and concrete, glazed tile and a patent silo brick are commonly used. All are reinforced, the brick and tile with heavy circular steel reinforcing rods laid in grooves in every course.

The cost of maintaining and operating such equipment is very low. L. A. Corwin of the Milwaukee Chair Co. states that before installing the silo system it cost them 32 cents per ton to store and handle coal from the cars to the stoker hoppers. It now costs 3.8 cents including power, labor and all upkeep.

The economic benefits of storing reserve supplies of coal are now generally recognized by all operators of steam generating plants. Coal can usually be purchased to better advantage and the reserve supply is valuable protection against losses due to inclement weather, strikes and tie-ups of the transportation system and mining operations.

Fig. 1 shows a typical arrangement of the silo system.

The Stephens-Adamson Manufacturing Company has recently acquired the United States rights for the Redler conveyor, which has a number of interesting features. Fig. 2 is a view of a Redler conveyor, discharging into another Redler. An obvious advantage, as shown here, is that one conveyor can take the place of two, a horizontal and a vertical.

The conveyor can be used to convey a great number of materials, among which are coal and ashes. The material is induced to flow in a compact, quiescent mass through a covered trough along any predetermined path, horizontal, vertical or inclined, with a remarkably small amount of power. The volume of the moving column of material is limited only to the size of the trough through which it travels. The trough may be run at any angle from the horizontal to the vertical. The path of the conveyor may be varied to avoid obstacles where necessary to meet varying and peculiar plant conditions. These conveyors can be fed or discharged at any point or points along their travel.

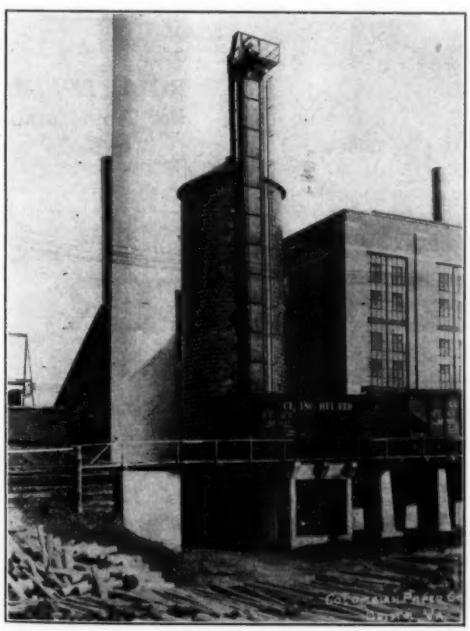


FIG. 3
Coal storage silo system and conveyors. (Fairfield Engineering Co.)

The Fairfield Engineering Company

Run of mine coal is delivered on the elevated railroad siding next to the boiler house in hopper bottom cars, and discharges the coal into the crusher which in turn discharges to the boot of the vertical bucket elevator. The crushed coal is elevated into the storage silo, which is provided with a live storage compartment at top. From this live storage shelf the coal is delivered through a chute to a traveling weigh larry, which distributes the coal to the stoker hoppers of the three 600 H.P. boilers. The coal that overflows the live storage shelf into the reserve storage compartment is re-elevated to the live storage shelf by the bucket elevator. Fig. 3 is a general view of the system.

A heavy bar grating with openings is placed over the hopper to prevent entrance of foreign matter and oversize coal into the system. The track rails over the hopper are supported on heavy girder beams.

The reciprocating plate feeder is driven by roller chain from the fixed roll shaft of the crusher. A plate hopper directs the coal into the crusher.

The crusher is of the double roll type. Coal is reduced to 1½-inch lump. The crusher is electrically driven through a belt drive, which is electrically interlocked with the elevator motor so that crusher and feeder will not operate until the bucket elevator is running at full speed. A hopper under crusher directs the crushed coal to the elevator boot.

The bucket elevator is of the centrifugal discharge type with malleable iron buckets mounted on a single strand steel bushed elevator chain. The elevator is driven through a series of cut spur gears by a motor, and is encased in a steel housing which is self-supporting, but is anchored at regular intervals to the silo to insure rigidity. At the head of the elevator an operating platform is provided, and access to same is by means of steel ladder, provided with safety cage, from ground level. An enclosed steel chute leads from the elevator head to the storage silo.

The storage silo is built of hard burned salt glazed tile with reinforcing rods between every course. The coal entering the reserve storage compartment is all reclaimable by the bucket elevator. The live storage shelf is built of reinforced concrete supported on steel beams, while the silo bottom sloping toward reclaiming gate is made of concrete laid on a cinder fill. The silo is covered by a conical roof made of heavy galvanized steel. Discharge gates are of the quadrant type. An enclosed steel chute leads from the live storage shelf through the boiler room wall, to the weigh larry.

The traveling weigh larry is of the motor propelled, floor operated type. It is motor driven, it is also provided with a chain for propelling by hand in case the current fails. The scale beam is fitted with a ticket recording device to register amount of coal used and is mounted in a box at convenient height for operator. The larry track is of structural steel, supported from the building structure, and is provided with limit switches at each end of the track to prevent over-run of the larry. Current collectors of the sliding shoe type are used.

The installation of the crusher permits the use of practically any size coal that may be available. Accurate check can be kept on the coal consumption of each individual boiler by means of the weigh larry.

b. Pulverized coal preparation and firing

Erie City Iron Works

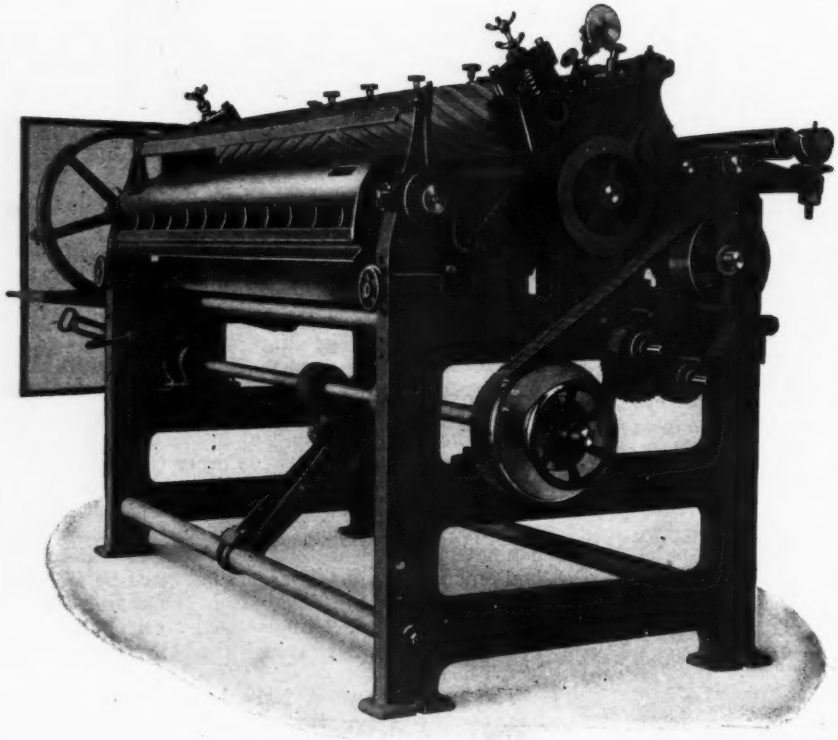
Fig. 4 ilustrates the new Unitype pulverizer. As compared with previous designs the most obvious difference lies in the addition of the classifier, the function of which is to eliminate coarse particles from the product and return

HAMBLET ROTARY PAPER CUTTERS

ARE IN USE

IN MORE THAN FIVE HUNDRED MILLS

THERE'S A REASON!



WE MAKE
Single and
Duplex Cutters

Automatic
Lay-Boys
For Single and
Duplex Cutters

ROLL STANDS
For Any Number
of Rolls

ROLLER BEARING CUTTER

Write for Full Information

HAMBLET MACHINE COMPANY

LAWRENCE, MASS.

them to the mill for further reduction.

The pulverizer has been completely redesigned, and the shell, fan housing, and base have been made of welded steel construction, in place of cast iron. The change greatly increases the strength of the parts without increasing the weight of the machine.

The fan has been enlarged in diameter to take care of additional resistance imposed by the classifier, and to give increased flexibility when operating under adverse conditions. Wearing plates have been fitted to the fan blades, and these may be renewed when worn out, greatly lengthening the life of the fan. The auxiliary fan air inlet has also been redesigned, improving the control of the air and eliminating the opportunity for occasional particles of coal to find their way out of the inlet opening.

The classifier is made with a screw feed for returning the tailings to the feed end of the machine, providing a positive and steady return of the coarse particles, and acting to reduce to a minimum the return of air carrying fine product from the classifier back to the mill.

Addition of a classifier has also made it possible to reduce the tip diameter of the third stage of paddles to that of the second stage, decreasing the weight and centrifugal forces of the rotor, and its inertia. The rotor shaft is mounted in self aligning ball or roller bearings, the former being used in the smaller, and the latter in the larger sizes.

The feeder is of the rotating table and scraper type, and is driven either by belt from the main shaft, or by a variable speed motor. The rate of feeding is controlled by the position of the scraper, or by the speed, or both, giving a wide operating range.

Provision is made in the feeder housing for the admission of preheated air for drying wet coal in the pulverizer.

A magnetic separator may be incorporated in the feeder to eliminate any tramp iron entering with the coal. The first stage is provided with a tramp iron pocket, which is easily emptied while the mill is running, to take care of any non-magnetic tramp material that may pass the separator, and the first stage padd'es are given ample tip clearance to enable them without injury to discharge such material into the tramp iron pocket.

The paddles are of our standard cast semi-steel, with heavily chilled wearing faces. From the combined viewpoint of durability and economy this material has proven itself superior to a large number of other materials which we have tested in competition with it.

The whole machine is sturdy, compact, and easily accessible, and has the wide range of capacity and the flexibility required to meet varying conditions of operation.

The Strong-Scott Manufacturing Company

Quite a number of pulverizer installations were made during 1932. Some of these involve the use of waste fuel (petroleum coke) or other fuels, such as lignite and stripmine screenings. An installation of particular interest is one recently completed by the Orenda Corporation at their

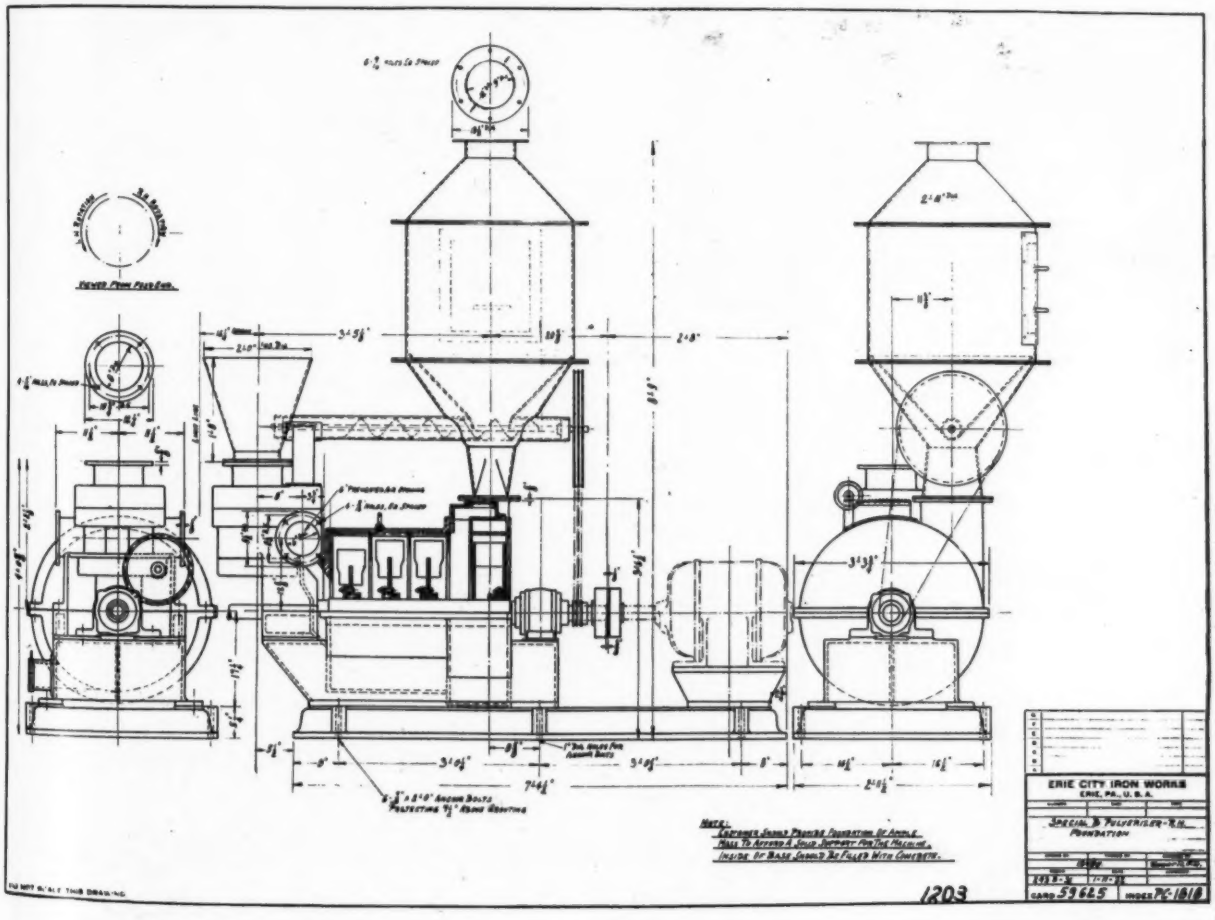
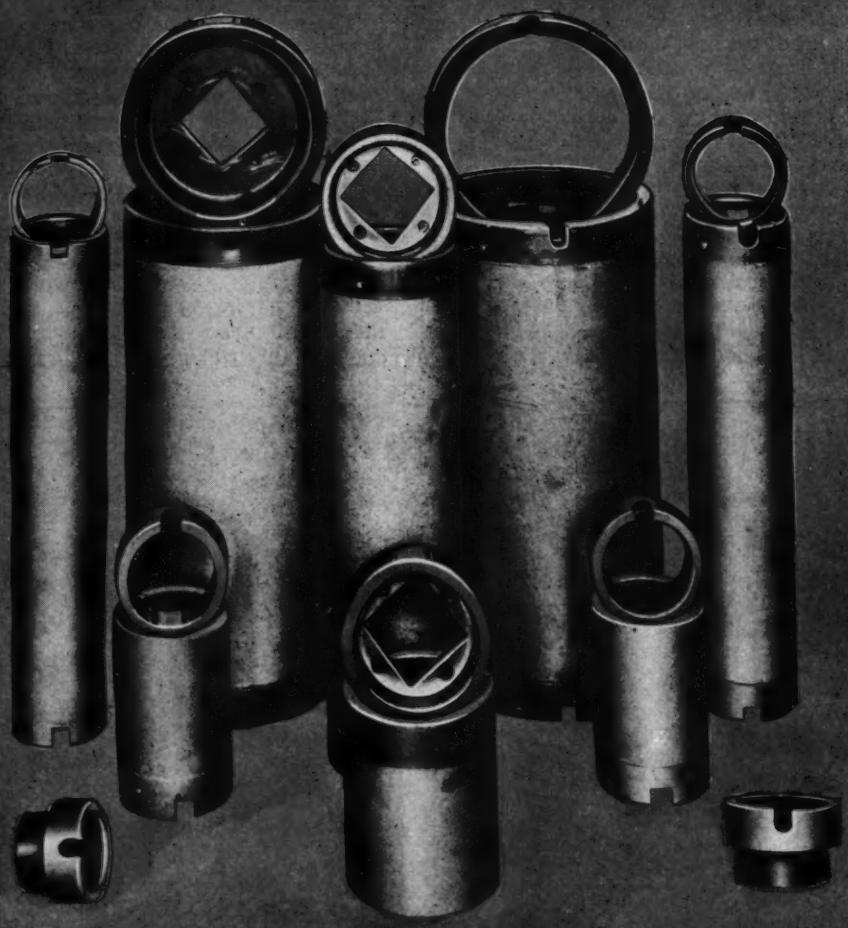


FIG. 4
Unit type pulverizer. (Erie City Iron Works).

ELIXMAN



Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all sizes.

Heavy duty caps with reenforced square hole. This new patented feature of reenforcement gives added strength and durability.

Samples of caps or cores will be gladly submitted.

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

FIG. 5
Unipulvo pulverizer. (Strong-Scott Mfg. Co.)

Wilmington, Ill., paper mill.

Coal being used in the new Strong-Scott pulverizer at the Wilmington plant is from the local strip mine of the Northern Illinois Coal Corporation. The proximate analysis of a composite sample as reported by the Commercial Testing and Engineering Company is in per cent: Moisture 14.05; ash 9.50; volatile 35.55; fixed carbon 40.90; ash fusion temperature 2050-2100 deg. F.; and by separate determination: sulphur 1.59; and heating value 10,908 B.t.u.

Several attempts had been made to pulverize and burn this coal but with no practical success because of the high moisture content. More than usual interest was therefore evinced in this installation.

The secret of success is said to lie in the combination of a large air cooled furnace which provides highly preheated air to the mill and a pulverizer through which all the air required for combustion can be drawn to assure sufficient drying effect to handle the high moisture content without condensation and sticking. The pulverizer is a 7000 lb. per hour Strong-Scott Unipulvo driven by a 100 hp., 1755 r.p.m. motor.

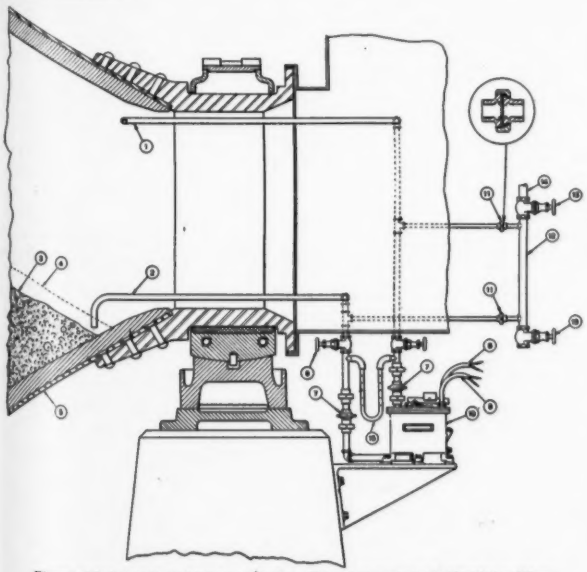


Diagram of feed controller and ball type pulverizer. The various parts may be identified as follows: 1: Upper pipe inside of mill. 2: Lower pipe placed at desired charge level. 3: Minimum charge level. 4: Maximum charge level. 5: Pulverizer shell. 6: Shut-off valve. 7: Air filters. 8: Electric circuit to feed mechanism. 9: Electric circuit to signal lamp. 10: Housing around floating bell. 11: Orifices. 12: Air manifold to forced draft duct or other source of air pressure. 13: Air pressure control valves opening manifold to atmosphere. 14: Pipe to source of air pressure. 15: U tube differential gauge.

FIG. 6
Feed controller and ball type pulverizer. (Foster Wheeler Corp.)

The "A-6" Unipulvo unit pulverizer, shown in Fig. 5, has recently been brought out by the Strong-Scott Manufacturing Company for handling bituminous coal screenings, pitch, lignite, or petroleum-coke breeze, in capacities ranging from 200 to 750 pounds per hour. The pulverizer is entirely self-contained and mounted on a single bedplate. One 7½ hp. motor provides power for pulverizing the fuel and handling all the air required to burn that fuel, when operated at its rated capacity. A ⅓ hp. motor actuates the fuel feeding mechanism, being bolted to the same pad which carries main driving motor. When operating at nominal rating, with motor running at 3450 r.p.m., the actual power input is approximately 6 hp., when handling mid-western coals such as Illinois or W. Kentucky.

The Foster Wheeler Corporation

Among the advances made during the past twelve months may be cited the development of the tricone ball mill and fuel feeder control. The perfection of a feed controller for ball mills provides a distinct advantage and one which has not previously been developed with any success.

Accompanying line drawing (Fig. 6) indicates the arrangement of parts and the operation is as follows:

The noise of ball mills in operation is objectionable in power plants and practically all Foster Wheeler ball mills installed recently have been enclosed in sound-proof housings which are so effective that the mills make less noise than the drive motors.

The level controlling device includes two pipes which extend through the hollow trunnion into the mill, one pipe extends into the upper portion of the mill and the other pipe is bent downward so that the end of the pipe is at the level desired for the charge within the mill. The outside ends of the pipes are open to atmosphere or they are connected to a source of air pressure above atmospheric such as the forced draft duct. A small orifice is placed in each pipe to permit a small amount of air to be drawn into the pipe by the suction under which the mill operates. Both pipes are connected to a controller which consists of a mercury sealed and floated bell. When the lower pipe in the mill is not submerged in the fuel and ball charge, the air pressure in each pipe is equal and consequently the air pressure on each side of the bell is equal regardless of change of pressure within the mill or at the outside ends of the pipes. The bell thus assumes a normal floating elevation.

When the end of the lower pipe is submerged by the rising of the charge, the small orifice rapidly admits enough air at atmospheric or higher pressure to raise the pressure within the pipe and likewise the pressure under the bell. This pressure differential, which can be measured by a U tube placed between the two pipes, causes the bell to rise and operate two mercoid switches. One switch disconnects the current to the feed mechanism and the other switch completes a circuit which lights a red signal lamp.

When the mill has discharged enough fuel to cause the charge level to fall below the submerged pipe, air pressure on each side of the bell is again equalized, current is again supplied to the feeder, and the signal light ceases to glow.

The feed mechanism of the mill is cross connected to the controller which governs the mill output. Thus, as the output increases the feed to the mill increases. When this adjustment is arranged so that the rate of feeding is slightly in excess of the discharge rate, the level controller will automatically maintain a constant level within the mill. The feeder, running slightly faster than necessary, will insure keeping the charge at the desired height, for the controller will interrupt the feed as the level builds up.

The accompanying drawing (Fig. 6) shows a diagram-

TAPPI SECTION, PAGE 74

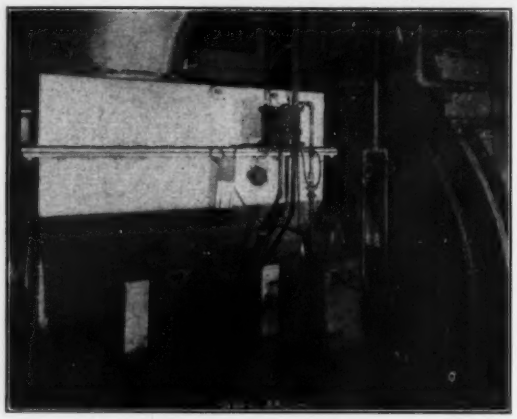


FIG. 7
Coal classifier with control device. (Foster Wheeler Corp.).

matic arrangement of the level controller and the photographs show a controller in service. The photograph on this page shows a U tube placed between two pipes into the mill and the small pressure differential required to operate the controller. In this case, when the outside ends of the pipes are open to atmosphere, the maximum differential is less than ½ inch of water.

The controller mechanism is simple and compact, as shown in the photograph (Fig. 7). The importance of accurate control of the fuel supply in ball mills renders them perfectly adaptable to the unit system of pulverized fuel firing and eliminates the cost of a storage system in many instances where it might otherwise be considered of advantage.

The Whiting Corporation

The old Bethlehem Pulverizer was recently taken over by the company and completely redesigned. Improvements claimed are:

Lower power consumption than any other pulverizer of similar capacity. Adjustable grinding pressure. A table roller pulverizer with adjustable spring pressure on the grinding elements. The air separation principle is responsible for uniform fineness of the product irrespective of the wear of the grinding elements. The slow rotation speed of the machine and the differential speed between table and rollers assure thorough pulverizing of the product by crushing and attrition. The use of preheated air, or hot gases for separation, makes it possible to dry the product while it is being pulverized.

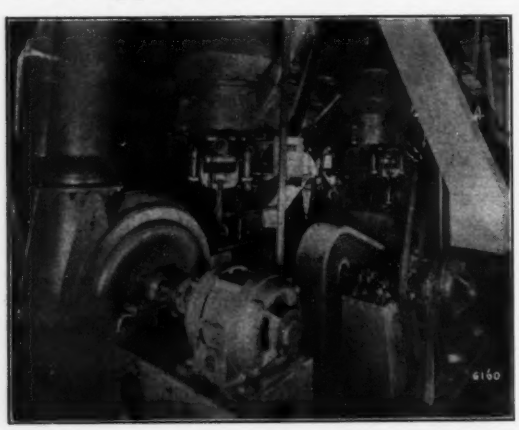


FIG. 8
Modern pulverizing plant. (The Whiting Corp.).

Physical changes made consist of the following:

The main frame casting has been materially strengthened. The table has been changed from an all cast iron casting to cast iron with a cast steel hub. The roll track plate is made in one piece and thicker than formerly. By eliminating the use of segments, the most pronounced cause of vibration and pounding in the wholl mill has been appreciably reduced. Lubrication is by forced feed from an oil tank outside the pulverizer, and operated with a pump powered by an individual motor. All bearings have been completely redesigned. A major change in design affecting the pressure lever arms, hinge shafts and block, has been made which eliminates all former troubles that existed at these points. A motor driven variable speed transmission feeder replaces the old rachet type feeder.

Fig. 8 illustrates a modern pulverizing plant.

The Babcock & Wilcox Company

The capacity range of coal pulverizers has been considerably extended during the past year by reason of the successful operation of a very large and the development of a small pulverizer. Pulverizers are now available with capacities as high as 50 tons of coal per hour and as low as ¼ ton per hour.

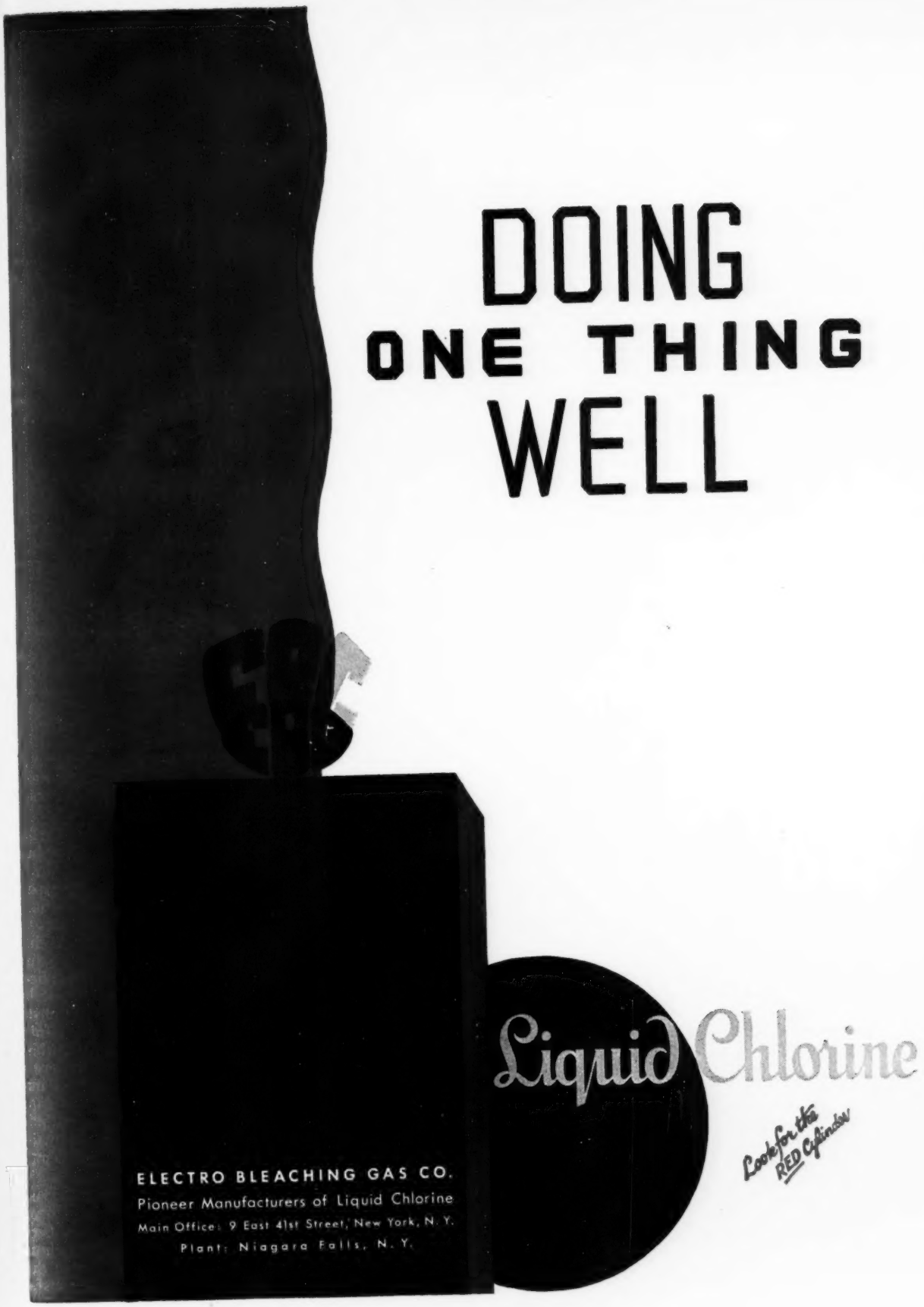
The large B & W type B pulverizer, which has on test pulverized 54 tons of coal per hour, is installed in the Kips Bay Station of the New York Steam Corporation and has been in satisfactory operation for over six months. The mill is nominally rated at 50 tons and is the first Type B Mill to be supplied with a third inner row of grinding balls.

The small B & W type B pulverizer, has an integral feeder and blower and was developed to meet the demand for a pulverizer for small and medium sized direct-fired boilers and for melting and heating furnaces, core ovens and similar aplications. Only one motor is used for driving the grinding elements, feeder and blower. It is built in sizes ranging in capacity between ¼ and 5 tons of 50 grind-ability coal an hour.

It is interesting to note that both the large and the small pulverizers mentioned employ the same ball-bearing grinding principle and that this method of pulverization has proved successful in producing the required fineness with any grade of coal.

The Company has expended no little effort during the past year on the development of combination fuel burning equipment, a step toward the design of a universal furnace in which all kinds of fuels can be burned either separately or in combination. The reason for these efforts has been the widening market for oil and gas in boiler plants which, while periodic, seasonal or temporary with coal as the base fuel in many plants, still makes the use of such a furnace highly desirable. A number of successful applications have been made, not only in existing equipment but in new designs as well. In one case, in a large central station, gas and pulverized coal have been burned successfully for over a year, both singly and in combination. In this case the B & W intertube pulverized coal burners were made available for burning gas by inserting gas nozzles into the secondary air ports between the secondary air dampers, connected to the gas supply line by suitable manifolds and piping. The conversion was greatly complicated by the size of the units and the fact that the furnaces were completely water-cooled.

The application of oil burning to pulverized-coal fired water-cooled furnaces is much more complicated than that of gas-fired furnaces and a special burner has been developed for this purpose. The burner is of the twin-nozzle type and is inserted between two tubes in front of the pulverized coal burner. The tips are so set that a satisfactory


DOING
ONE THING
WELL
Liquid Chlorine
Look for the RED Cylinder
ELECTRO BLEACHING GAS CO.
Pioneer Manufacturers of Liquid Chlorine
Main Office: 9 East 41st Street, New York, N. Y.
Plant: Niagara Falls, N. Y.

mixture of fuel and air is obtained by distributing the oil across the air stream.

Another interesting development, especially of interest to paper mills, is that of the B & W circular multifuels burner which is used for firing through refractory burner walls in small or moderate size industrial boiler units. With this horizontal turbulent type burner, liquid, gaseous and pulverized solid fuels can be injected into the furnace through a common circular throat opening. Any one, or a combination of the fuels can be burned at once. It combines the features of the B & W Circular Burner and the B & W mechanical atomizing oil burner and has proved very successful in service.

c. Coal burning equipment.

The Detroit Stoker Company

In Fig. 9 is shown a longitudinal side elevation of a Detroit multiple retort stoker. Arrows indicate flow of zoned air to various parts of the fuel bed. Fig. 10 shows a Detroit multiple retort stoker in brickwork seen from the rear.

The improved Detroit stoker might briefly be described as an inclined fuel bed stoker with effective underfeed action with a continuous movement of the fuel under full mechanical control. Closely spaced, square retorts have large capacity that permits slow distillation. Large square rams insure ample coal feed. Separate adjustments of coal feed can easily be made, effecting correct distribution within the furnace.

Tuyeres are of the plate type for which the manufacturer claims long life due to effective air cooling. High side wall plate tuyeres prevent clinker adhesion to the side wall brickwork. The front wall is provided with sectional wind boxes protecting the brickwork against erosion.

Zoning of air and variation in tuyere openings effects a correct air distribution at comparatively low pressures. Preheated air may be used if desired. A unique design of extension moving grates at the rear of the retorts insures complete burning of coke in the refuse. Heavily constructed power operated dumping grates are provided.

The Hoffman Combustion Engineering Company

Minor modifications of Firite stokers have not been in the principle of combustion involved, but purely in foundry and machine shop practice. We have been able to improve in a general way the quality of our furnace castings. Volume production has made it possible to put a production line in the machine shop and assembly where each machinist or assembly shop practice have resulted in greater precision and working to smaller clearances.

Wider field experience has suggested some small improvements in design, which have worked out effectively. One of these is a higher jet action in the secondary air,

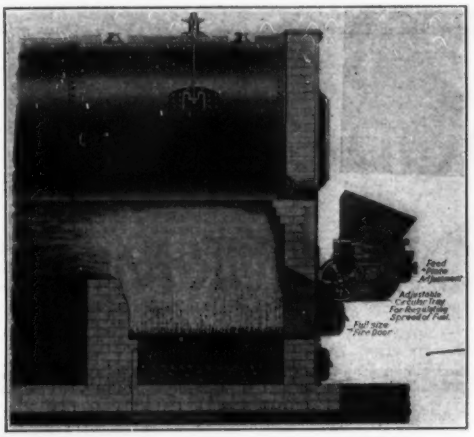


FIG. 11
Firite stoker. (Hoffman Combustion Engineering Co.).

creating greater turbulence directly above the fuel bed. Inasmuch as this equipment is used extensively for burning coke breeze, and because of the abrasive action of this fuel, we have done extensive experimental work in the use of high resistance facings on most parts of the equipment coming in contact with the fuel in motion, as a consequence of which stellite faced parts are available, and also easily removable non-expensive replacements may be made.

On account of the complete synchronization of air and coal supply, together with the natural turbulence in the furnace, these Stokers may be operated at continuous high CO_2, and as a result of our experience in dealing with these high furnace temperatures, patented water cooled members have been designed for protecting the impeller mechanism against excessive radiant heat. Monel metal shaftings, running in water cooled oversized bearings, and nichrome impeller blades are available at a slight additional cost. Fig. 11 illustrates the general appearance.

In the future stokers will be selected for their ability to burn the most favorably disposed fuel supply; whereas in the past fuel has been provided to meet the requirements of the stokers.

There is another feature in connection with this type of coal burning equipment which will have a beneficial effect upon the entire stoker industry, evidences of which are on every hand. In the past, an excessively high factor of maintenance has been considered a necessary evil in connection with stoker firing, particularly when operating at high ratings and when burning high sulphur coals, coal of low ash fusion temperatures, or other special characteris-

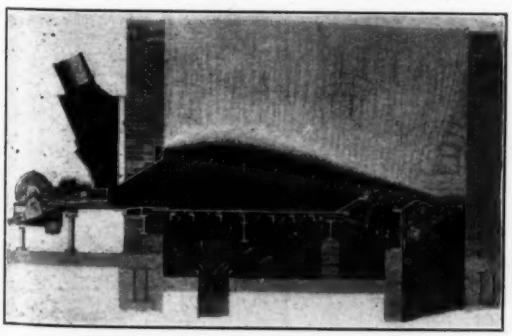


FIG. 9
Detroit multiple retort stoker—arrows indicate zone air to all parts of fuel bed. (Detroit Stoker Co.)

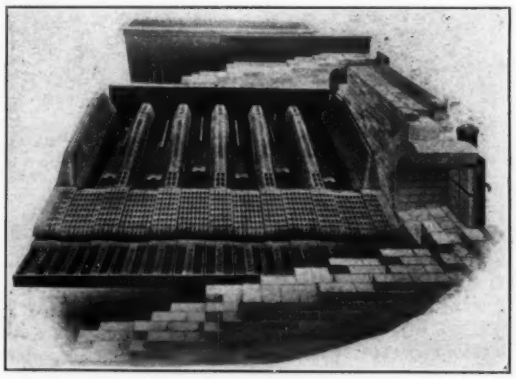
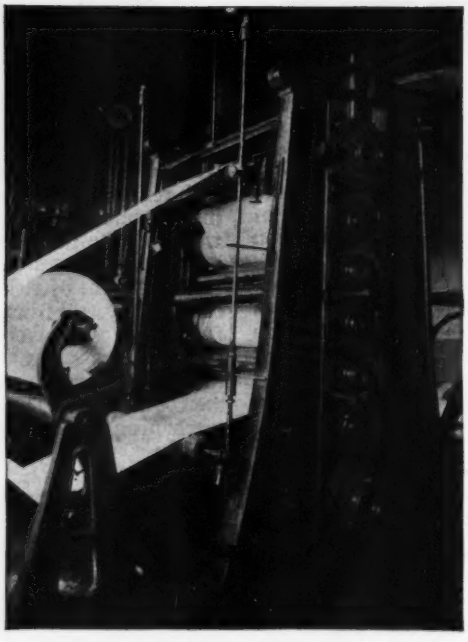


FIG. 10
Detroit multiple retort stoker—rear view shows a portion of brickwork. (Detroit Stoker Co.)

DODGE WILL GIVE YOU MORE FOR YOUR MODERNIZATION DOLLAR

You can get more for your "modernization" dollar if you come to DODGE with your power drive and bearing problems. You can save by replacing your old drives with new DODGE Hypoid Gear Units. You can replace your old babbitted bearings with Dodge-Timken Units which save power and maintenance and require no adjustment or attention other than infrequent lubrication.

You can buy Dodge-Timken Bearings for Breast, Table, Couch, Wire, Felt, Press and Dryer Rolls as well as for Supercalenders, Jordans, Shredders, Grinders, etc., and they can be installed in your mill with labor which is available and at the time most convenient to you. All of this can be accomplished without heavy capital expenditure as you can do much of it out of your maintenance budget.

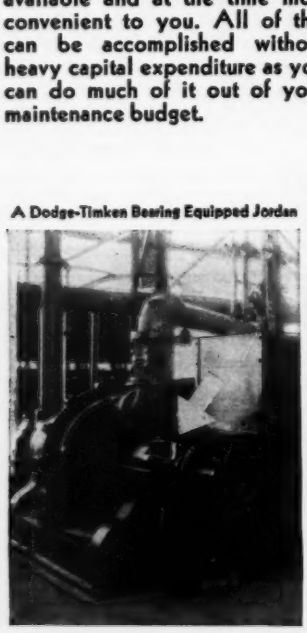


A Dodge-Timken Equipped Supercalender in mill of Miami Valley Coated Paper Company at Franklin, Ohio. One of twelve Supercalenders similarly equipped and operating satisfactorily in leading mills

DODGE has specialized on power drives and power transmission engineering for over half a century. Many representative mills are still being driven by Dodge rope drives installed many years ago. In later years DODGE has kept pace with the demands of the industry and has designed and built unit drives, the latest development being the Dodge Hypoid Drive.

DODGE is the originator of the self-contained, factory-adjusted Dodge-Timken Bearing Unit, which has found wide favor in the paper industry. Over two thousand of these units are installed in one large mill and have proved their worth on every application for which they have been recommended. Why not ask DODGE to make suggestions which will save money for you?

A Dodge-Timken Bearing Equipped Jordan



A Dodge-Timken Special Cylinder Mold Bearing

REG. U.S. PAT. OFF.

DODGE

MISHAWAKA

DODGE MANUFACTURING CORPORATION • MISHAWAKA • INDIANA

Modern Power Transmission Equipment

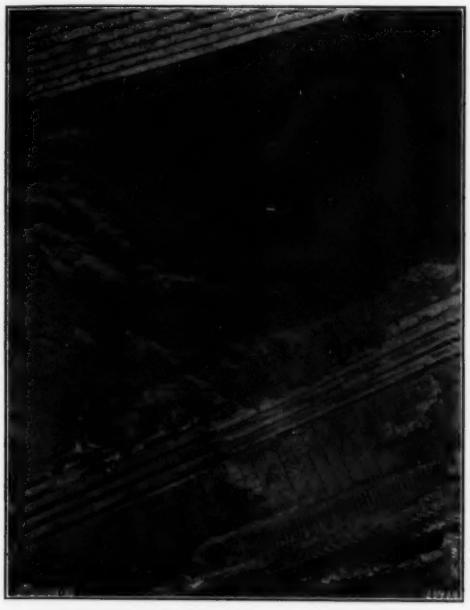


FIG. 12
AECO slag drip water wall stoker. (American Engineering Co.)

tics. The almost total lack of maintenance experienced under the most adverse conditions with the spreader type stoker will not only stimulate its wide distribution and use, and more especially in low grade coal districts, but has and will continue in the future to stimulate the manufacturers of underfeed stokers to better design and to the use of more suitable and higher heat resistance metals. The stoker of the past has been a foundry product. The stoker of the future will be essentially a machine shop product. The day of the mechanical shovel is past.

The American Engineering Company

During the early part of the year, a Taylor six retort, twenty-nine tuyere, crusher type stoker and AECO side and rear walls, installed under a 605 hp. straight tube boiler, were placed in operation at Iowa State University, Iowa City, Iowa. This installation was made to burn Iowa coal of approximately 9500 B.t.u. with from 4 to 5½ per cent sulphur and 15 per cent ash, having a fusing temperature at less than 2000 deg. F. Tests on this equipment show high CO_2 in the boiler flue gases and an efficiency averaging over 80 per cent, without the auxiliary heat recovery devices. The underfeed stoker handled this grade

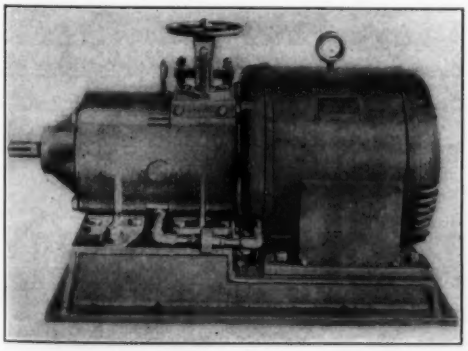


FIG. 13
Combined Hele-Shaw transmission of electro-hydraulic drive. (American Engineering Co.)

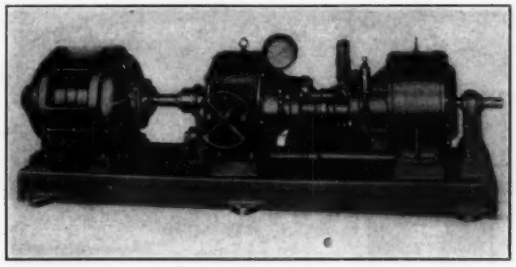


FIG. 14
Hele-Shaw split transmission electro-hydraulic drive. (American Engineering Co.)

of fuel which heretofore at this plant has been burned on chain grate stokers.

The side water walls on this particular installation consist of five cast iron block covered tubes and four bare tubes, which follow the general slope of the stoker, with the latter so arranged as to form a slag drip, which prevents the molten slag on the brickwork above from running down and interfering with the operation of the side retorts of the stoker.

Fig. 12 illustrates the AECO slag drip section showing bare tubes projecting into the furnace beyond the face of the refractory and block covered surfaces, and illustrates the method of chilling the slag at the slag drip ledge. Numerous walls of this construction are now in operation with complete satisfaction.

Further developments have been made in the design of electro-hydraulic drives with the advent of a combined electric and hydraulic motor, which is capable of a wide speed range. Fig. 13 illustrates this unit. The machine is a self-contained unit, with pump and hydraulic motor combined with a built-in electric motor, all mounted on a base which serves as a reservoir for the oil required by the system. This unit has been commercially operated, assuring a practical, positive, variable speed transmission. The electric motor is of the fan cooled type, the fan being mounted to the rear of the motor. The oil in the system is passed through finned tubing surrounding the fan which maintains the required oil temperature for the most efficient operation of the transmission. The necessary make-up and relief valves are incorporated within the pump casing, the latter being set prior to shipment from the factory. Manual or automatic control can be applied.

This unit with a speed ratio of 30 to 1, gives a stoker drive range selective enough so that the stoker can take care of a wide, fluctuating load. The transmission can further be applied to any driving mechanism where varying speed conditions are required.

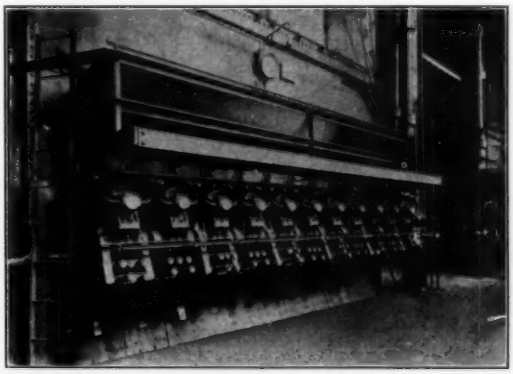
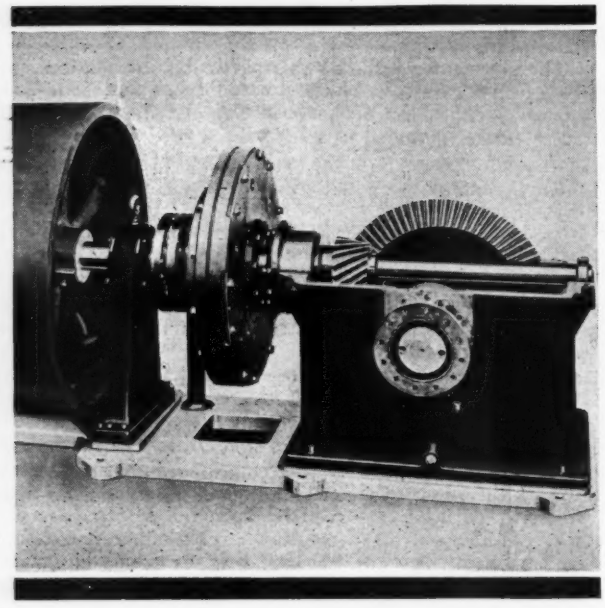


FIG. 15
The Taylor hydraulic stoker. (American Engineering Co.)

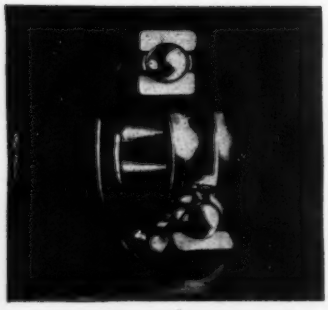
THE SKF GALLERY OF DISTINGUISHED PERFORMANCE USERS:

RICE, BARTON & FALES, INC.

"MORE SKF BEARINGS BEING USED EVERY DAY"



SKF Bearings are used throughout spiral bevel gear drives built by Rice, Barton & Fales for driving paper machines. Continuity of operation ... week in and week out without bearing trouble ... is demanded of this equipment. SKF's meet the most exacting requirements ... and on the basis of such confidence SKF Performance Takes Preference Over Price.



Precision is a mighty important factor not only in the life of spiral bevel gear drives but also the kind of service they will render. SKF's increase the life of parts because they are free from wear, need no adjustments and consequently maintain original tolerances indefinitely. It is dependable performance alone that makes this paper making machine manufacturer say: "We have used hundreds and hundreds of SKF Bearings in the last number of years ... throughout the paper machine ... and more are being used every day."

SKF INDUSTRIES, Inc.
40 East 34th Street, New York, N. Y.

2999

WHERE PERFORMANCE TAKES PREFERENCE OVER PRICE

● *You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little*

SKF BALL AND ROLLER BEARINGS

Where conditions do not warrant the use of the combined unit, the split transmission is available. Fig. 14 illustrates the hydraulic pump, hydraulic motor and electric motor on a common bedplate. The hydraulic motor need not be near the hydraulic pump, but can be placed in any desired location connected by piping. Both types of machines, besides giving an infinite number of speeds between zero and maximum, are also capable of giving reverse rotation with equal selectivity of speed in either direction, controlled either manually or automatically.

Two of the latter machines have been recently installed in conjunction with paper calenders in an Eastern Paper plant, which are used to regulate speed and maintain a constant tension on the paper winding roll regardless of the number of windings on the roll. This winding device has eliminated previous troubles experienced with tearing of paper, caused by unequal tension on the roll during the winding process.

A Taylor stoker operated by hydraulic rams, actuated with oil, has been developed, (Fig. 15). This type of stoker presents advantages in that the driving mechanism is simplified with the elimination of crank shafts, power boxes, gears, couplings, shearing pins, etc. The use of the same hydraulic driving pump and controls for both the stoker and crusher roll drive is novel with this machine. Further, interconnection of driving pumps may be made so that one pump may drive more than one stoker. Maintenance is reduced as all parts operate in an oil bath, and breakage of any parts is eliminated, as when the feeding rams meet an obstruction they will automatically operate on shortened stroke until the obstruction is dislodged. The ram then resumes full stroke.

During the past year, there have been several additional installations of Taylor automatic zoned air control for the accurate distribution of air to the tuyeres of underfeed stokers. The operation of the control either by automatic or manual means had demonstrated its usefulness and practicability. Outline drawing Fig. 16 illustrates venturi air throats which distribute air to each tuyere row in the stoker.

d. Ash handling equipment.

The American Engineering Company

A new type of bottom discharge cast iron plate Ash Hopper with hydraulically operated clam shell gates has been developed for installations having low basement head room. Fig. 17 illustrates the ash hopper and gates for low basement heights, while Fig. 18 shows this same hopper

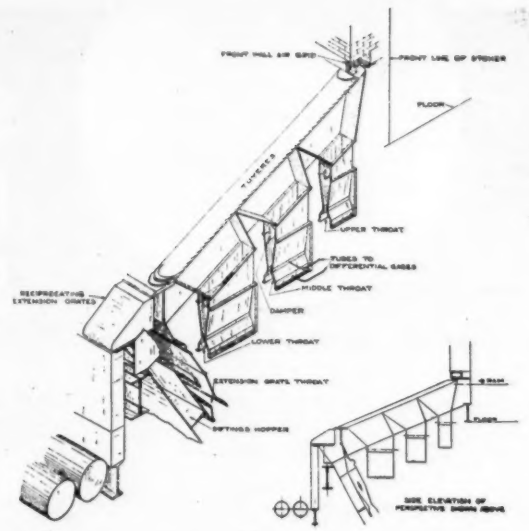


FIG. 16
AECO zone air controller. (American Engineering Co.)

when the capacity has been materially increased by the addition of upper steel frame work and iron plates. These hoppers are fabricated in sections with individual gates and drip troughs and are suitable for installation on any width of stoker numbering three retorts and above. Though primarily this equipment was designed for receiving the ash discharge from underfeed stokers, it can be used on any class of stoker having rear ash discharge.

1. Ash hoppers
2. Ash conveyors, etc.
3. Dust arresters.

American Air Filter Company, Inc.

This concern produces a Turbo Cyclone Dynamic Precipitator combining blower and dust separator in a single unit.

Riley Stoker Company

A flue gas scrubber is produced by this company, consisting of a series of ribbed plates so located as to cause the flue gases to impinge against them during the passage of gas through the scrubber. A thin film of water flowing over the faces of these plates carries away the fly ash and cinders. The amount of water flowing over each plate is regulated. It is claimed that during actual tests ninety

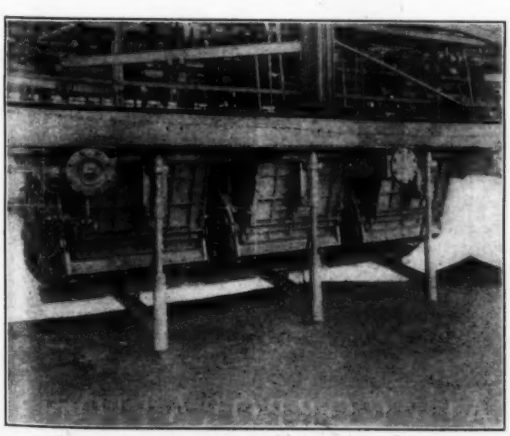


FIG. 17
AECO ash hopper—low basement heights. (American Engineering Co.)

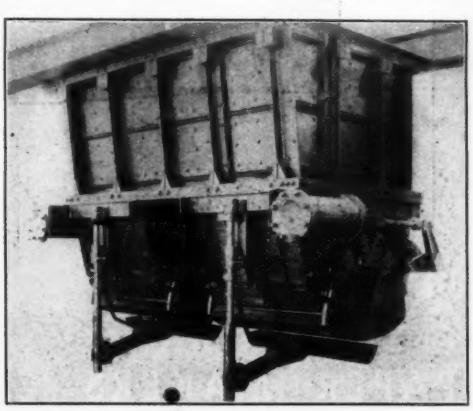


FIG. 18
AECO ash hopper. (American Engineering Co.)

PMC
SUPERIOR CHEMICALS

SUPERIOR
ROSIN SIZE
SATIN WHITE
INDUSTRIAL CHEMICALS

Experience has taught users of paper-making chemicals that P. M. C. products are uniform and reliable. These qualities are insured by quantity production, by control of raw materials, and by specializing in the manufacture of chemicals for the paper manufacturer.

PMC

PAPER MAKERS CHEMICAL CORPORATION
KALAMAZOO, MICHIGAN
PLANTS IN ALL LARGE PAPER-MAKING AREAS

PM-10

per cent of the fly ash in the gases from a pulverized fuel-fired boiler has been removed by this scrubber.

B. OIL AND GAS FIRED PLANTS.
a. Fuel storage and handling.
b. Gas and oil burning equipment.

The Babcock & Wilcox Company

In order to burn the increasingly important fuels such as heavy oils, tar, pitch and acid sludges such as are found in quantity in petroleum refineries, the Company has developed a new steam-atomizing burner and proved its merits by exhaustive tests. Steam is admitted to an annular space around a central oil barrel and projected across each outgoing stream at the nozzle plate, effecting complete atomization and a short turbulent flame. For variations in capacity the oil and steam pressures are varied, a single nozzle plate being used for maximum ratings.

The Company has also developed a new wide-range mechanical atomizing oil burner which can be used either in the standard B & W register or as the oil burning element of the Multifuels Burner. With this burner a capacity variation of four to one with any one sprayer plate and nozzle may be secured. Fuel oil is pumped through the burner in two passages, an outer annular passage carrying the primary oil stream and a central oil barrel carrying the secondary oil. Both meet at a nozzle and sprayer plate at the burner tip. Changes in capacity with a given nozzle and sprayer plate are secured by operating with primary oil alone or with primary and secondary oil. Very satisfactory results have been obtained with this burner. Atomization is excellent, the oil flow from the burner nozzle being in the form of practically a perfect cone.

The Coen Company, Los Angeles, Cal.

During the past year installations have been made of mechanical oil burners and improved air registers in the boiler plants of some of the paper mills on the Pacific Coast. The latest development of this company is a new outside joint tubular oil heater, which has just been subjected to a series of severe expansion and contraction tests. The heater withstood all tests and developed no leaks. The heat transfer was in line with expectations, according to heating surface and velocity in the various oil passes.

This new design oil heater (Fig. 19) is fitted with double tube sheets, thus making a straight tube heater, free from danger of leakage through tube joint from oil to steam space, as space between tube sheets is open to the atmosphere. This construction absolutely prevents danger of getting oil into the heater condensate and from there to the hot well, boiler feed, etc. Expansion and contraction strains are taken care of by means of an expansion joint built into the heater shell and are further minimized by tube spacing, the first pass being through a group of tubes in the center of the heater, other passes radiating concentrically from the first pass, thus bringing the hottest oil tubes (oil being inside tubes) nearest the heater shell which takes on steam temperature.

Steam admission to the heater is through an annular space at either end of the heater and outlets from this annular space distribute the steam uniformly into either or both ends of the steam space. Condensate drains are provided at either end of the heater and on either side, so that the heater may operate in any position, vertical, horizontal or upside down. The heater shell will be covered with insulating material, over which will be placed sheet metal held in position with chrome plated bands. The heater will be tested to at least 500 pounds on both steam and oil sides and can be built for any steam working pressure desired and tested accordingly. The tube sheets are plate steel and

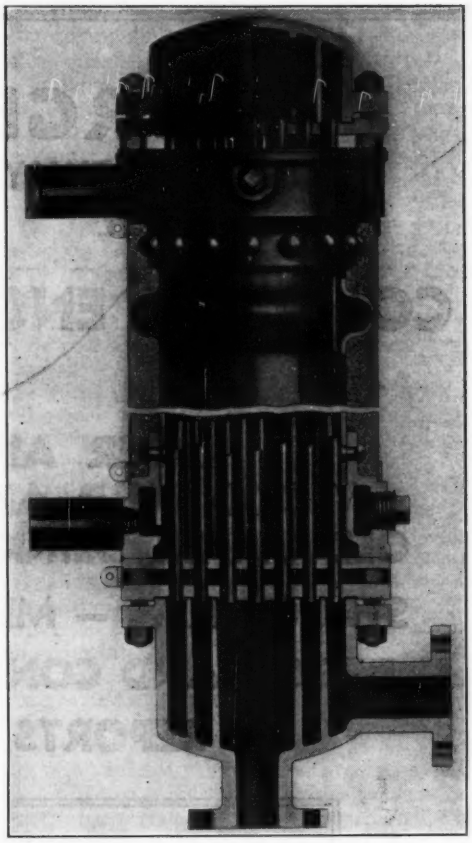


FIG. 19
Outside joint tubular oil heater. (The Coen Co.)

the inner tube sheet is welded to the casting to make this joint steam tight. This design of heater can be furnished for practically any capacity and temperature conditions that may be specified.

C. WOOD AND OTHER REFUSE FUELS.
a. Fuel storage and handling equipment.

The Link Belt Company

One of the more recent installations for handling of hogged fuel is one made by the Link-Belt Company, Chicago, at the plant of the Puget Sound Pulp & Timber Company at Everett, Washington. This is a 175 ton bleached sulphite mill, located on tide water on Puget Sound. No electric power is generated at the mill, this power being brought from a utility. There are no lumber-

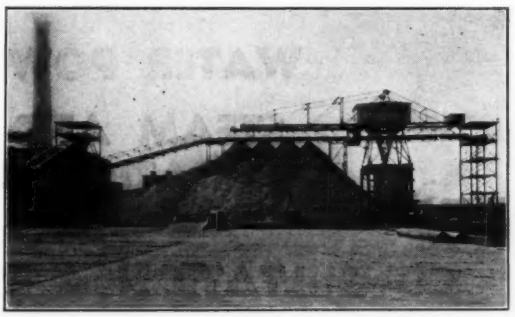


FIG. 20
Wood fuel unloading and storage equipment. (The Link Belt Co.)

GEORGE F. HARDY

305 BROADWAY NEW YORK

Mem. Am. Soc. C. E. Am. Soc. M. E. Eng. Inst. Can.

COMPLETE ENGINEERING SERVICES

for

PAPER AND BOARD MILLS
WOOD PULP AND OTHER FIBRE MILLS
OLD PAPER DEINKING AND RECLAMATION

STRUCTURAL — MECHANICAL — ELECTRICAL

DESIGN AND CONSTRUCTION SUPERVISION

REPORTS ON FINANCING

INVESTIGATION AND REPORTS
For
MODERNIZING PLANTS AND PROCESSES
NEW COMMERCIALLY SUCCESSFUL METHODS
IMPROVE QUALITY
LOWER PRODUCTION COSTS
POWER FROM PROCESS STEAM

STEAM FROM WASTE HEAT RECOVERY

SODA AND LIME RECOVERY
CHEMICAL PULP BY-PRODUCTS

WATER POWER DEVELOPMENTS

STEAM AND ELECTRIC POWER GENERATION AND TRANSMISSION

CONSULTATION — ESTIMATES — APPRAISALS

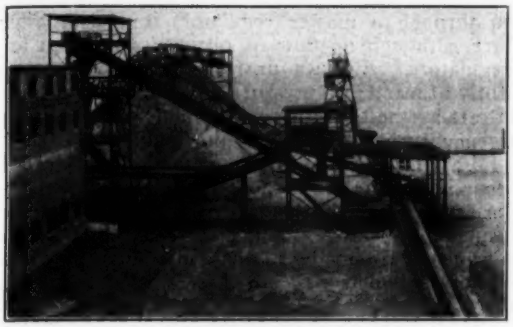


FIG. 21
Anti-friction belt conveyors, belt tripper, chain elevators, transfer table chains, flight conveyor, movable hopper and chain drives for wood fuel storage. (The Link Belt Co.)

ing operations taking place at the mill site, with the exception of the preparation of logs for the manufacture into pulp. The steam requirements of the mill are taken care of by four 865 hp. boilers, equipped with Dutch ovens for the burning of hogged fuel. All the hogged fuel is shipped in, except the sawdust and bark from the wood room. The outside sources of supply are (1) from the company's own saw-mill operations, (2) from outside saw-mills delivered by scow and (3) from outside saw-mills delivered by railroad car or truck.

It is obvious that conditions necessitate the carrying of a considerable storage and a storage space accommodating 1,500,000 cubic feet of hogged fuel has been provided. It is also obvious that a flexible system of conveyors are necessary to provide for the several means of receiving the fuel and the conveying to and from storage or direct to the boiler house. In Fig. 20 is shown a crane used to unload scows by means of a clam shell bucket into a hopper, discharging onto a belt conveyor, which in turn discharges on a cross conveyor, shown at the left in the photograph. The crane is also shown in the background in Fig. 21. The conveyor shown in the lower right hand corner of Fig. 21 is used to convey fuel received by rail or truck or from the wood room. The cross conveyor, which is a double strand, heat treated, rivetless chain with wood flights, may be used either to supply the boiler house or the storage pile. The lower strand of the conveyor, supplying the storage pile, is used to reclaim the storage. This is a single strand, rivetless chain with cast steel flights.

All belt conveyors are equipped with Timken bearing troughing idlers. All sprockets on the flight conveyors are provided with break pin hubs. The steel chutes, used to discharge the hogged fuel into furnaces, were also furnished by the Link-Belt Company.

b. Fuel burning equipment.

The M. A. Hofft Company

The tendency now in designing boiler plants for pulp mills and woodworking industries is to design a boiler setting for the highest possible efficiency on the major fuel, wood, and not to burn the wood in a furnace designed for the auxiliary fuel, coal.

An inclined-grate furnace, called the National stoker, which together with the National arch and sometimes in connection with feeding equipment have been recently developed.

In designing a furnace for burning of refuse consideration must be given to a number of properties of the fuel, among which is the moisture content. Fig. 22 shows a furnace recently designed for the Dominican Republic for the burning of a fuel, which contains a little more than 70 per cent moisture. It will be noted that for a fuel of this moisture content a steep incline and a long refractory hearth or drying out space are required. For a dryer fuel the incline is less steep and the hearth is shorter.

The grates are longitudinal and there are no moving elements in the upper end of the grates. The air spaces at this point are horizontal, so as to prevent dripping of fine fuel into the ash pit. The lower section of the grates is provided with rows of fuel pushers, each row being individually operated from the front by a separate lever. Since the grates are longitudinal and stationary, there are no projections or crossridges to hold up the fuel. The refuse fuel deposited at the upper end slips slowly down the grate as it burns, avoiding the necessity of shoving the refuse fuel down the grate. With the proper angle to the grate, the fuel does not avalanche and make a big pile at the bottom.

There are dumps at the lower end of the grates for the removal of ash. The cleaning of the fire is accomplished by raising the lower row of pushers operating between the stationary grates and dropping the dumps.

The raised lower row of pushers prevents the slipping of good fuel into the ash-pit and at the same time kicks off the ash and clinker through the dump opening. The fuel bed on the main body of the grates is not disturbed in this operation. The fuel pushers travel through between the stationary grates and kick off the ash and clinker without the necessity of poking through the cleanout doors. The dump openings are the full width of the furnace. Any sand slag that may be formed will be on the lower section of the grate and is removed by the operation of the other rows of pushers.

The forward tilted bridge wall and the arch contour are to force a mixture of the heavy volatile gases distilled off the drying pile with the hotter, lighter gases rising off the lower end of the grate. These gases are finally burned in the combustion chamber back of the bridge wall.

It is important that it has been possible with these stokers to burn fuel of a high moisture content without an auxiliary fuel, and that installations have met the requirements of smoke inspection departments. Recent installations, burning wet bark and wood room refuse with a moisture content up to 65 per cent, have been operated at peak loads of 300 per cent rating and continuously at 200-250 per cent rating. CO_2 recorders have shown this gas to be 13-15 per cent. Overall efficiency depends, of course, on the kind

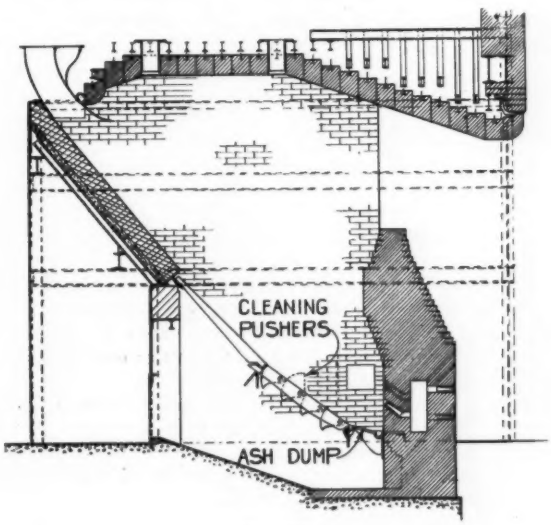


FIG. 22
The National stoker for burning wood refuse. (M. A. Hofft Co.)

of wood being burned and the moisture content, but good efficiencies have been obtained with these installations.

D. Combustion and boiler control.

Bailey Meter Company

At the Munising Paper Company's new power plant automatic combustion control maintains steam pressure within two or three pounds of the desired figure, and secures the highest combustion efficiency consistent with economical operation. The steam pressure is maintained through the master steam pressure contactor operating through control drives to increase or decrease fuel and air in accordance with load changes indicated by steam pressure. It regulates the speed of forced and induced draft fans by throttling the steam supply to fan turbines.

Economy is secured by gearing the control directly to the steam flow-air flow relation of the boiler meter, with adjustments made to the induced draft so that air supply is consistent with best combustion. In addition, the primary air temperature is automatically controlled to maintain a desirable average.

Flexibility is available and also full automatic, push button or manual control as desired.

The Leeds & Northrup Company

Their electrically-operated control system functions to maintain a definite relation between load demand acting upon the master controller and the rates of supply of fuel and water. Auxiliary controllers measure forces representative of the quantities regulated and operate the damper, valve or other element until the value of that force corresponds with the load demand transmitted through the master controller. The adjustment of the regulated device is independent of position settings, dampers, valves, etc.

Master automatic, semi-automatic and push button control are provided, supplemented by ready means of distributing the load between boilers. Electrical relay devices require small forces from sensitive measuring elements and relay them to the larger forces necessary for controlling heavy equipment. Protective and alarm features, starting and sequence interlocks of boiler auxiliaries can be incorporated. A single conduit is required for control.

The fuel and draft controllers have been simplified and reduced to a beam balance consisting of one moving part. Each metering controller weighs the quantity being regulated.

Smoot Engineering Corporation

The master panel of the combustion control forms a centralized control point for the entire boiler room, uses the steam heater pressure variations as indications of the variations in steam demand, and distributes low pressure air impulses through small control lines to regulators located at each boiler. These regulators in turn control the various elements entering into the boiler furnace in continuously accurate proportion to each other and to the plant steam demand in response to the air pressure impulses from the master panel.

At each boiler, fuel feeder regulators maintain the rate of feed in proportion to the master panel impulses. Also individual air regulators proportion the rate of combustion air supply by operating the outlet damper controlling the induced and forced draft fan speeds.

Mercury gauges indicating the rating of each boiler, rates of fuel and air supply, the fuel air ratio or CO_2 content are supplied with the master panel. Adjustments are provided on the panel for the use of the operator while the boilers are under control.

Brooke Control

This system essentially is actuated by steam pressure which, through a master regulator, controls master oil pressure, although no flow of oil occurs between any of the regulators. Furnace draft regulators operate independently of master oil pressure, maintaining constant furnace draft by the operation of the boiler uptake dampers. Emergency furnace units shut down the pulverizers and forced draft fans upon a failure of the induced draft fans. All other regulators are responsive to the master oil pressure in accordance with load demand. All regulators except emergency ones are subject to electric hand control. Arrangements are made so that any pulverizer may be used with any boiler.

E. Steam boilers, generators and superheaters.

a. Boilers, generators and superheaters.

The Foster Wheeler Corporation

During the past year certain interesting installations have been made by Foster Wheeler Corporation in the pulp and paper industry. It may be said that these are chiefly devoted to improvements based on more economical operation, as contrasted to units of excessive size and capacity.

As an example, the accompanying line drawing (Fig. 23) of a four drum, bent tube steam generator may prove interesting. This unit consists of a 668 hp. boiler section fired with pulverized coal in a water cooled furnace. Operation is at 450 pounds pressure and a double loop extended surface superheat. The heat recovery equipment consists of an extended type armored economizer and tubular air preheater. A study of the drawing will indicate the compactness and accessible arrangement of the layout. It will show that a minimum cost is included in the manufacture and construction of the parts and that convenience to operators will hold the cost of maintenance to a minimum. Design figures on this unit anticipate an overall operating efficiency of 85½ per cent.

It would be unfair to say that any one part of this steam generator is a radical departure, yet there is no doubt that

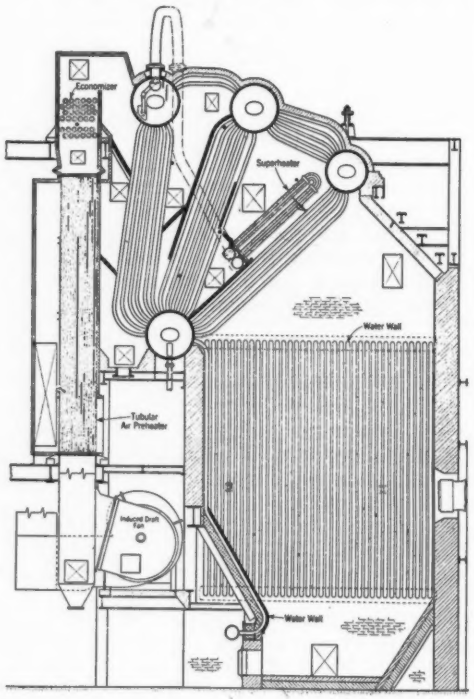


Fig. 23

4-drum bent tube steam generator, 450-lb. pressure, 668 h.p., fired with pulverized coal in a water-cooled furnace. (Foster Wheeler Corp.)

careful attention to detail has given a design of material improvement over similar units built in the past. The economizer delivers water to the boiler at 270 deg. F. and the air heater provides a temperature of 375 deg. F. in air for combustion and reduces the stack gas temperature to 330 deg. F.

It is felt that the improvements in design in the various factors comprising a steam generator have not been of outstanding importance in themselves but that the contemplation of combinations of these units indicates material improvement and that still further progress may be expected in the future.

The Babcock & Wilcox Company

At this time the pressure and temperature of steam generated in power boilers seem to have reached a maximum at about 1500 pounds and 900 deg F., although the Company has designed, built and exhaustively tested a series boiler for operation at 3500 pounds per square inch pressure. This boiler is described in a paper entitled "Once Through Series Boiler for 1500 to 5000 pounds Pressure", presented by H. J. Kerr before the December, 1931 meeting of the A.S.M.E. Alloy tubes for superheaters where the higher temperatures are desired are finding increasing use.

The increase in the number of fusion-welded drums since the approval of this construction by the A.S.M.E. boiler code committee has given gratifying evidence of the merits of this construction.

While we have been able to develop steam generating equipment for greatly increased pressures and temperatures without radical change in typical designs, we have found by experience and research that to secure the same reliability and continuity of service as has prevailed at lower pressures and temperatures greater care in details of materials, design and construction is necessary by reason of the greater complications of internal stresses incidental to these higher pressures and temperatures. Research is still in progress and the results secured combined with our experience with installations in service, has placed the Company in a position where it has been able to supply steam generating equipment for any pressures and any temperature so far called for.

The Superheater Company

Present tendency is to design superheater headers to be located outside of the boiler. This gives the maximum amount of accessibility and protection to the headers and their joints.

Typical superheaters all are multiple-loop, single-pass units, by which the steam makes a single pass from the saturated-steam header to the superheated-steam header, through multiple loops of the length required to give the steam characteristics set for the installation. Steam travels through all units of the superheater in parallel, thereby maintaining uniform absorption of heat.

The superheater installation illustrated in Fig. 24 uses outside header construction, parallel flow and the superheater supported from overhead steel work. The degree of superheat can be controlled by the damper in the baffle under the rear end of the superheater.

The superheater installation illustrated in Fig. 25 has the same fundamental design features as the original superheaters installed in this plant, in 1919, in similar boilers for 600 deg. F., at 250 pounds pressure and 200,000 pounds of steam per hour. The superheater units are located amongst and parallel to the boiler tubes of the first bank. This location gives a uniform steam temperature over a wide range of operation, due to the superheater surface being in relatively close proximity to the furnace and close to that boiler surface which is generating the largest proportion of steam. The headers are located outside of the boiler.

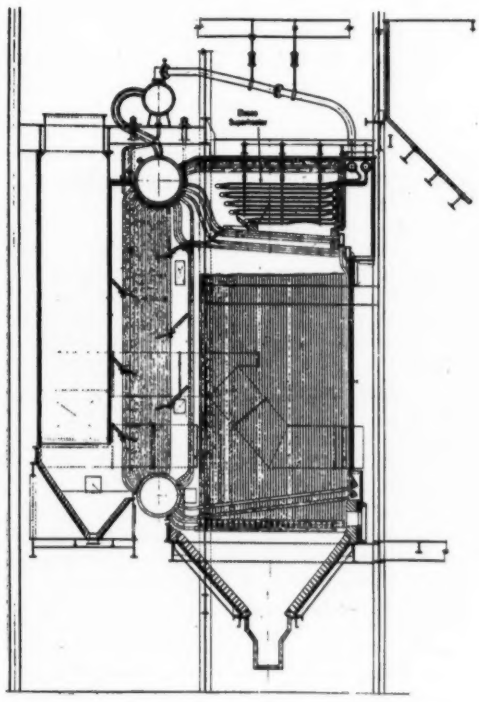


FIG. 24

Elesco convexion superheater with outside heaters, parallel steam flow unit supported from overhead steel work—superheat controlled by a damper in baffle. Steam temperature—750 deg. F.; superheat—237 deg. F.; pressure—750-lb. per sq. in.; evaporation—150-lb. steam per hour. (The Superheater Co.)

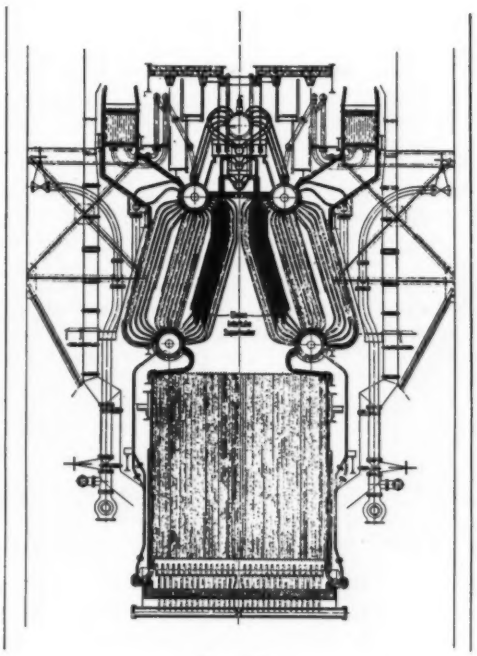


FIG. 25

Elesco inner tube superheater with outside heaters, units absorbing heat by retardation and convexion. Steam temperature—750 deg. F.; superheat—165 deg. F.; pressure 1350-lb. per sq. in.; evaporation—5000-lb. steam per hour. (The Superheater Co.)

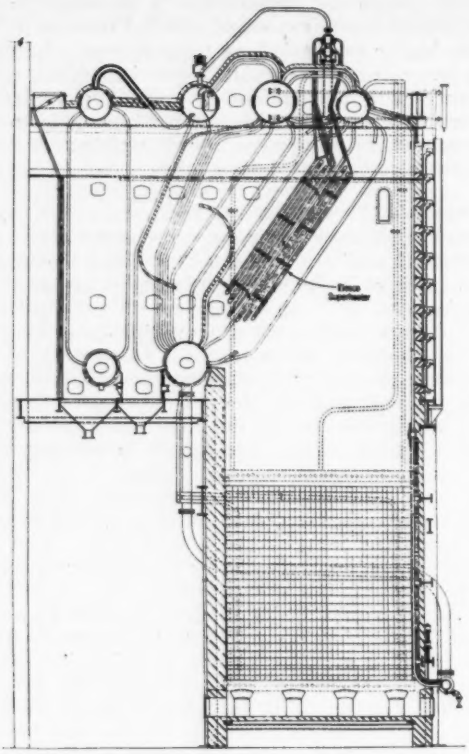


FIG. 26
Elesco superheater installation, designed for a final steam temperature of 669 deg. F. at 290-lb. pressure when the boiler is generating 200,000 lbs. of steam per hour. (The Superheater Co.).

The superheater installation (Fig. 26) shows the possibility of locating part of the superheater surface amongst the boiler tubes of the first bank and the balance back of the first bank of tubes. With this arrangement minimum superheating surface is required and at the same time, a more uniform degree of superheat is obtained over a wide range of operation. Both headers are located outside of the boiler.

For smaller plants, with h.r.t. boilers, of which there are doubtless a large number in the pulp and paper industry, our new h.r.t. superheater should find wide application. It is illustrated and described in our Bulletin T-22.

A new and improved superheater was developed recently by this Company in answer to the widespread demand for a superheater easy and economical to install in horizontal return tubular boilers. Unique in design, this superheater is of compact and simple construction, so simple, in fact, that it may be installed readily by regular plant attendants. No changes are required in settings or arches of the boiler or in other plant equipment. The superheater is standard for all h.r.t. boilers.

It comprises simply two cast-steel headers, suspended one on each side of the boiler shell, which are connected by detachable tubular elements or units extending around the underside of the boiler. The headers are supported by adjustable clamped steel rods. By raising or lowering the headers, the units are correspondingly raised or lowered in the combustion chamber, which regulates the superheat or final temperature of the steam.

This superheater is automatic in operation. Saturated steam is carried from the boiler nozzle through a connecting pipe to one header, known as the saturated steam header. From there it passes to the other header or superheated-steam header, through the units under the boiler, of the gasses of combustion in the combustion chamber, during which it is subjected to the relatively intense heat The steam, then superheated, passes to the main steam line for use in the plant.

By superheating steam in this positive, simple manner, many economies, which hitherto were reserved to larger plants, are made possible to the steam plant with h.r.t. boilers.

b. Blowdown systems.

The Cochrane Corporation

Along with the operation of boilers at higher pressures there are also greatly increased rates of driving, which necessitates closer attention to the control of concentration of solids in the boiler water by blowing down in order to prevent a harmful amount of priming and foaming, which not only affects the superheat where superheaters are used but is also dangerous to engines and turbines. The ideal condition would be where the concentration of boiler water were held steadily at the maximum value which could be held without carrying over water and solids into the steam line, since this degree of concentration would be accompanied by the lowest practicable amount of blowdown and hence the least loss of water and heat.

The concentration of solids in the boiler water cannot be held at this point, however, by intermittent blowing since if the blowdown is intermittent the concentration must be carried to a much lower point at the time of blowing down in order to leave a margin for it to build up again to the maximum permissible point. Intermittent blowing down, also, does not lend itself to the recovery of steam and heat from the blown off water, since the recovery would be intermittent and the apparatus required for recovery would be large and expensive.

These difficulties have been overcome by the perfection of the Cochrane continuous blowdown system wherein a comparatively small blow off pipe is run from the upper drum or the furnace tube header to a location which will be convenient to the operator in adjusting the continuous blow off valves and in drawing samples of blow off water for testing. The discharges from the several blow off control valves enter one common manifold and the latter discharges into a flash tank having suitable baffles inside for purifying the flashed steam. The steam may be recovered at a relatively high pressure where required, as at a pressure between that of the boiler and that of the exhaust. Otherwise the flashed steam may be condensed in heating the feed water either by direct admission to the exhaust line or in a flash condenser, depending upon operating conditions.

There are a number of advantages in recovering heat by flashing water in the steam instead of recovering it directly from the boiler blow off water by means of a heat exchanger, one of which is that distilled water is returned to the boiler equal in amount to approximately 27 per cent of the water blown from the boiler, assuming that the boilers are operated at 450 pounds pressure and less heat is lost in the hot water. For higher pressures the percentage of distilled water recovered will be greater, while at the lower pressure the percentage recovered will be less but still sufficient to make its recovery a valuable consideration.

The recovery of as much heat as possible by flashing reduces the amount of surface required in heat exchangers, which are apt to become fouled by solids deposited by the boiler water, whereas no deposits interfere with the recovery of heat from the flashed steam. Furthermore, in heat exchangers steam on one side of the tube surface in-

stead of water on both sides results in higher heat transfer through a given area of heating surface. Flashed steam is also under a lower pressure than is the high temperature water.

Cochrane continuous blowdown systems having the features above mentioned are installed at the plants of the Harriman Company, Harriman, Tenn.; The Mead Straw Pulp Company, Chillicothe, Ohio; The Fort Frances Paper Company, Ft. Frances, Ont.; The Howard Smith Paper Mills, Cornwall, Ont.; and the Philip Carey Mfg. Company, Lockland, Ohio.

F. Economizers.

The Babcock & Wilcox Company

Development of economizers has been confined chiefly to refinement of details rather than to major changes during the past year.

Economizers have gradually become more generally used and according to present indications this trend will continue. The development of the steaming economizer, where steam is generated in the economizer, has in reality made the economizer the forced flow stage of a two stage boiler. This subject has been the object of study by the Company over a period of 16 years. Some of the salient facts discovered are to be found in a paper by H. J. Kerr.

The Green Fuel Economizer Company

A new tubular type air preheater has been developed in which the tube sheets may be fixed stationary and each tube allowed to expand or contract independently.

The tubes are arranged either vertically or horizontally and are not expanded into the tube sheets. This particular feature allows the tubes to be easily removed for inspecting and reinstalling. In case the tubes become more corroded on one end, they may be inverted and thus double the life of the heating surface. If, due to any unusual conditions, the tubes should plug up with soot or fly ash, it is a simple matter to take them out, install spares, and clean out the plugged tubes at a convenient time. With expanded tubes this is not possible. Fig. 27. The tube sheets are made of cast iron and therefore will last indefinitely. The tubes are of steel for temperatures encountered in the flue gases of boiler plants. For higher temperatures cast iron tubes can be furnished.

The joint at the end of the tube is made up with packing which is set in a machined groove around the tube. The packing (a special material for high temperature) is held in place with a circular ferrule and the ferrule is pressed into place with a cast iron gland, forced down with a stud bolt. Heaters of this construction are absolutely air tight. The gland also provides a flared entrance and exit for the gases, thereby giving the least resistance to flow.

These heaters are inexpensive and have been built with varying lengths of tubes up to 40 feet. The gas flow may be either inside or outside of the tubes, thereby adding extreme flexibility for adapting the heater to practically any available space.

The Foster Wheeler Corporation

The Dow Chemical Company recently installed at its Midland (Mich.) plant a boiler specially designed for the use of Dowtherm, which is a mixture of diphenyloxide with diphenyl or other phenolic and benzol derivatives.

Although gradual progress has been maintained in the improvement of heat transmission, it is undoubtedly safe to say that the outstanding developments do not apply to the transmission of heat in water or steam, as so well developed in the past.

The use of diphenyloxide or "Dowtherm" offers improvements and advantages developed only recently. In this method diphenyloxide is heated in a specially constructed boiler and the vapor is circulated through pipes, just as in the case of steam. The characteristics of diphenyloxide render it more effective as a heat carrying vehicle and for use in temperature ranges up to 700 deg. F., it frequently offers great advantages, especially the low pressure of the system.

The accompanying drawing (Fig. 28) shows one arrangement of diphenyloxide system with boiler fired by a single oil burner placed vertically at the bottom of the furnace. This installation has actually run for many months with entire satisfaction and one of its peculiarities is the forced circulation of diphenyloxide through the boiler.

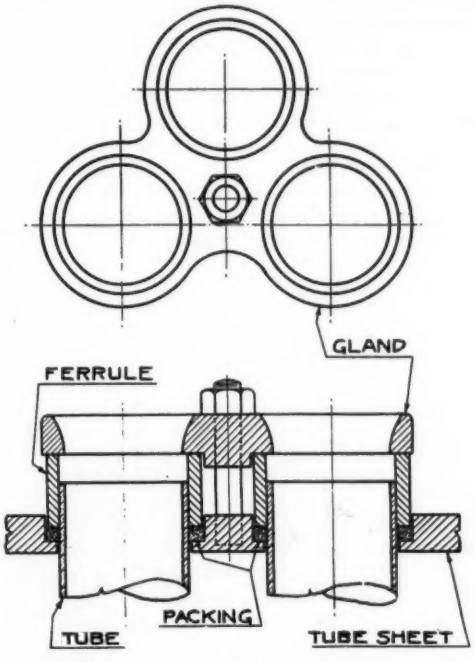


Fig. 27
Air heater tube joint. (Green Fuel Economizer Co.)

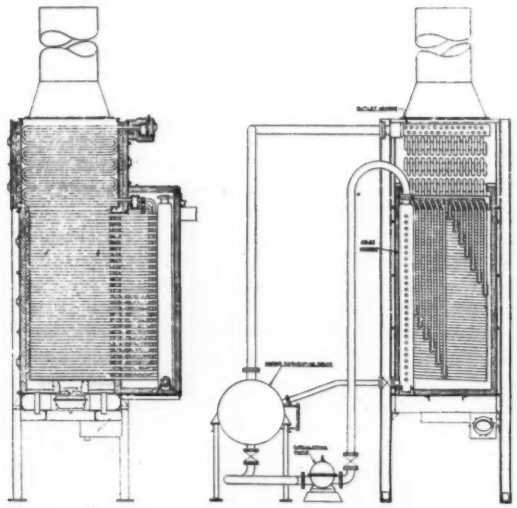


Fig. 28
Front and side elevation of Dowtherm boiler with casing and insulation removed to show arrangement of pressure parts. (Foster Wheeler Corp.)

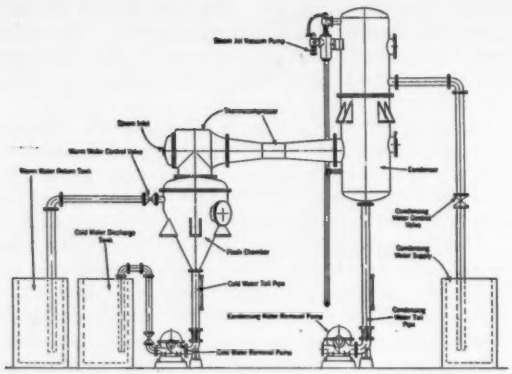


FIG. 29

Diagram of a typical vacuum refrigeration system showing all the apparatus used in the system. (Foster Wheeler Corp.)

An installation of diphenyloxide indicating one instance of successful commercial application is that of recovering heat from flue gases in a power plant through the circulation of diphenyloxide in an economizer constructed along the lines of a feed water economizer. The heated diphenyl is then carried through insulated pipes a considerable distance to coal pulverizing equipment where air heating is effected through an extended surface air heater directly at the point of use, part of the air being introduced into the coal pulverizer and the balance at the burners for combustion of the pulverized coal. If it had been attempted to carry the large quantity of preheated air from an air heater placed at the location of the diphenyloxide heater, the loss of heat in transmitting the air through large ducts over the distance involved would have been so great as to eliminate most of the gain to be obtained from a heat recovery system.

The transmission of heat in a negative direction, that is refrigeration, has an important place in the paper industry and great attention is now attracted to the system of vacuum refrigeration. This consists of drawing a high vacuum on a chamber and in that way establishing the temperature in the chamber. Various fluids may be introduced into the chamber and through the vaporization of the portion of the liquid which carries off heat of vaporization from the remainder of the fluid to be cooled, the desired cooling is accomplished.

In the paper industry cool water is frequently required for the finishing rolls of paper machines and for after recovery in sulphite mills. It is estimated that 75 per cent more sulphur dioxide can be absorbed with water at 40 deg. F., than with water at 75 deg. F.

The possibilities of vacuum refrigeration are not limited to the cooling of water and it is possible to evaporate water at temperatures below the normal freezing point, thus making it possible to cool brine for freezing and refrigeration purposes. The attached line drawing (Fig. 29) indicates the simplicity of a typical vacuum refrigeration system, the only requirements being steam at a pressure of 100 pounds or more and a reasonable supply of circulating water. The rotors of centrifugal pumps are the only moving parts in the system and its fool proof arrangement and consistent operation have been great points in its favor.

G. AIR HEATERS.

The Babcock & Wilcox Company

It has been found that air heaters can be used to exceptional advantage with pulverized coal firing. By the use of pulverized coal, water-walls and air heaters any kind of coal can be successfully burned. Also, air heaters are a great aid in burning all types of fuel oil. The Company has adopted the tubular type of air heater because of its practical construction, ease of cleaning, air-and-gas-tightness, economy in first cost per square foot, and because an even distribution of the hot gases can be secured and because with this type properly operated and designed corrosion is materially reduced.

H. BOILER FEED.

a. Water treatment.

The Cochrane Corporation

The outstanding charactertistic of recent changes in boiler practice, particularly in pulp and paper mills, has been the introduction of higher steam pressures, which in turn has resulted in more exacting requirements as to water conditioning methods and processes. Paper and pulp mills generally require a considerable percentage of make-up because of water lost in processes. Such make-up water is advantageously softened in a hot process softener from which it is delivered either directly into a deaerating heater, which also receives the condensed returns, or else it is delivered to a surge tank wherein it is mingled with the condensed returns, after which it passes to the deaerating heater. In most boiler plants operated under high pressure the hot process softener is supplemented by the use of phosphate delivered either directly to the boilers or into the suction of the boiler feed pumps. The purpose of the phosphate is to make possible complete elimination of scale-forming hardness without the introduction of an objectionable excess of soda ash and to preserve a suitable sulphate-carbonate ratio to prevent embrittlement of the boiler metal. The use of deaerators to prevent oxygen corrosion of economizers, boilers, piping and turbine blades, and the use of phosphates to perfect the results of the hot process in high pressure boilers are characteristic of modern high steam pressure plants, as illustrated by the following examples.

At the plant of the Philip Carey Mfg. Company, Plymouth Meeting, Pa., the make-up water is softened in a Cochrane hot process softener and then pumped to a Cochrane deaerating heater which has a capacity of 100,000 pounds per hour and also receives the condensed returns, the make-up constituting approximately 60 per cent of the whole. The boiler feed pumps draw from the deaerating heater and deliver to Badenhausen boilers operated at 375 pounds per square inch. Phosphate to supplement the hot process treatment is fed into the suction of the boiler feed pump along with tannin to prevent feed line deposits. This treatment has been entirely successful both in preventing scale and corrosion within the boiler and in avoiding the formation of scale in the feed line.

At the plant of the Mead Straw Pulp & Paper Company,

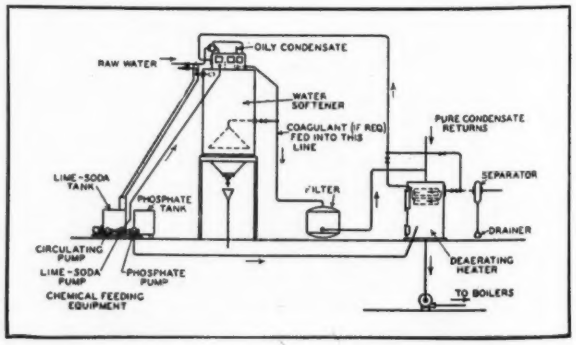


FIG. 30

Method of feeding phosphate into deaerating heaters. (The Cochrane Corp.)

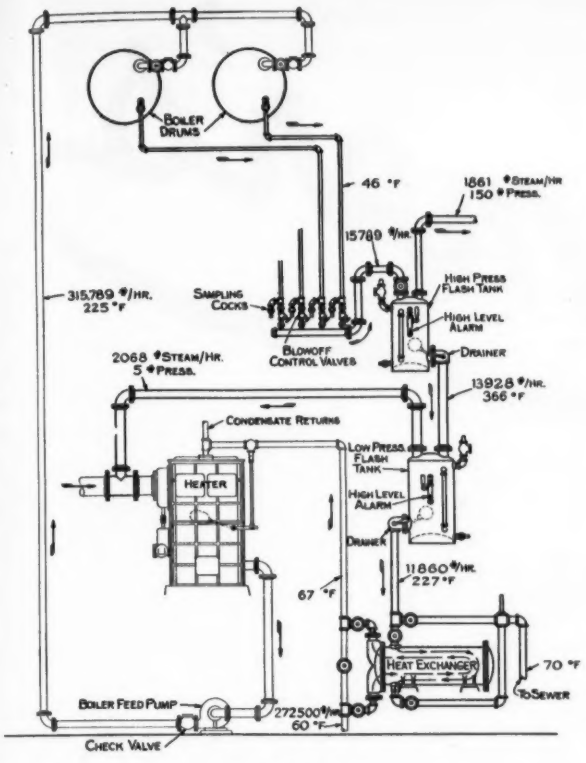


FIG. 31

Utilizing flashed steam at intermediate pressure and in open heater may be used with or without heat exchanger, patented. (The Cochrane Corp.)

Chillicothe, Ohio, water from the Cochrane hot process softener, together with the condensed returns, is delivered to a tank which supplies the Cochrane deaerating heater. The boilers are operated under 400 pounds pressure and a supplementary feed of phosphate is supplied to the suction of the boiler feed pump.

At the Lockland, Ohio, plant of the Philip Carey Mfg. Company, boilers are operated under 1800 pounds pressure to supply steam to triple expansion engines of German manufacture, which exhaust under 60 pounds pressure to make-up evaporators. The latter deliver steam at 40 pounds pressure to the processes. The water to be evaporated is first softened by the Cochrane Hot Process Softener which also supplies boiler feed for the low pressure boiler plant and for locomotives. The drips resulting from the condensation of the engine exhaust in the evaporators are first flashed to obtain low pressure steam and are then delivered to a Cochrane condensate oil removal filter from which they pass to the Cochrane deaerating heater and then to the boilers.

The largest 650 pounds pressure boiler of which we know has been in service continuously for a year at the Hamilton, Ohio, plant of the Champion Coated Paper Company without turbining or other major repairs. Approximately 30 per cent of the boiler feed is make-up prepared in a Cochrane Hot Process Softener and deaerated, along with the condensed returns, in a Cochrane deaerating heater.

Figs. 30 and 31 represent respectively methods of feeding phosphate into a deaerating heater and utilizing flashed steam in an open heater with or without heat exchanger.

The Hagan Corporation

A properly conditioned boiler water should prevent scale, inhibit corrosion, eliminate the danger from embrittlement, and minimize wet steam. Such a boiler water can be attained by the continuous maintenance of proper conditions therein, and to achieve this, simple but reliable tests should be made daily upon the boiler water to tell the operator whether or not he is meeting the requirements. Thus, the man in the plant is alone responsible for clean boilers and does not need to depend upon the magic of secret compounds. Only pure chemicals should be used and the analysis of each should be known. In this way, boiler water conditioning becomes an exact science, under definite control.

For the protection against embrittlement, the A.S.M.E. has recommended specific ratios of sulphate to alkalinity, and states that, "if the ratios . . . are maintained in the boiler water . . . 'caustic embrittlement' will be inhibited."

Corrosion is inhibited by the continuous maintenance of proper alkalinity in the boiler water, and deaeration of the feed water. The daily test should indicate the correct alkalinity value, and if it does not do this, steps should be taken immediately to secure it. To reduce oxygen in the feed water, maximum possible water temperatures should be maintained in a well vented open heater.

Complete prevention of scale can be secured by maintaining continuously within the boiler water a definite amount of unused, free phosphate. So long as this agent is present in the boiler water, any calcium in the feed is converted into a soft non-adherent precipitate. A reliable test for phosphate should be made daily to assure that conditions are right, and if any changes in the water have occurred since the last test, the amount of chemical to be fed for the ensuing period should be altered accordingly.

Reduction in wet steam can be brought about by maintaining in the boiler water low closely controlled alkalinities, proper regulation of blowdown, and a minimum of contamination. Since phosphate is used for scale prevention, the boiler water alkalinity can be controlled independently and held down to desirable limits, as only a small amount of hydroxide is necessary for corrosion prevention. Blowdown should be held as low as possible in the interest of economy. This also should be under definite control.

During the past year The Buromin Company was organized. This company sells Hagan phosphate under the trade name of BUROMIN. The purchase price of this material includes a retainer fee and also provides for service by Buromin engineers to assure that complete instruction and periodic check-up on operation are given. Thus, a Buromin user is an authorized user of Hall system. Both have the same protection.

b. Heating and deaerating.

c. Pumping.

Ingersoll Rand Company

Due to the availability of 3600 r.p.m. motors and turbines in horsepower sizes up to 200, encouragement has been given to designs of pumps which incorporate better hydraulics, thereby obtaining better efficiencies at higher speeds.

The Cameron Motorpump, known as the type RV, is a single stage, single suction, enclosed impeller, centrifugal pump with built-in electric motor. This pump is a portable, compact, light-weight unit, designed and built for general service in any class of work within its rating. It has found application in the power house as a circulating pump for small condensers, condenser condensate unit, heating system condensate unit, circulating pump for cooling water to diesel engine water jackets, transfer fuel pump for diesel engine installation, circulating lubricating oil from

TAPPI SECTION, PAGE 86

use Warner's

CHLORINE
CAUSTIC SODA
CARBON TETRACHLORIDE
BARIUM CHEMICALS
BLANC FIXE
BARIUM HYDROXIDE
BARIUM PEROXIDE
TRI SODIUM PHOSPHATE

Write our technical department. They will be glad to cooperate in the solution of your problems.

The WARNER CHEMICAL Co.

CHRYSLER BUILDING — PIONEER PRODUCERS 1886 — NEW YORK CITY

PLANTS

South Charleston, W. Va. Modesto, Cal. Carteret, N. J.

Exclusive Sales Agent for Westvaco Chlorine Products, Inc.
Also Sales Agent for Barium Products Ltd.

centrifuges to tanks, or, in many cases, for pressure lubrication of turbine and generator bearings.

The sizes of the Motorpump range from the fractional horsepower 1 inch pump up to and including the 25 hp. 4 inch pump. These pumps will handle from 5 to 800 g.p.m. of clear cold water against a total head of 10 to 200 feet. (Fig. 32) (Fig. 33).

I. METERING.

The Republic Flow Meter Company

During the past year various improvements have been effected in steam metering equipment. A new line of mechanical type meters has recently been introduced which offer the following features either severally or in combination—square root or evenly divided charts—automatic planimetering—multipen action for flow temperature and pressure—compensation for temperature and pressure—automatic control and record.

The Leeds-Northrup Company

The company has recently brought out a unique type of flow meter which balances the gravitational force of a tilting manometer against the force exerted by a motor driven centrifugal pump. This arrangement results in a direct relationship between flow and motor speed. Among its interesting features the equipment offers higher accuracy in the integration of flow, particularly at 20 per cent scale and below.

The Bailey Meter Company

One past inconvenience in flow measurement has been the limited capacity of individual orifices, which has been recently met by the development of an adjustable meter orifice. This consists of a flange body with gate orifice and integral meter connections. A manometer adjusting screw permits setting the height of the gate segments within .001 inch. It is stated the maximum capacity may be varied as much as 40 to 1, thereby giving an equivalence to a large number of fixed orifices.

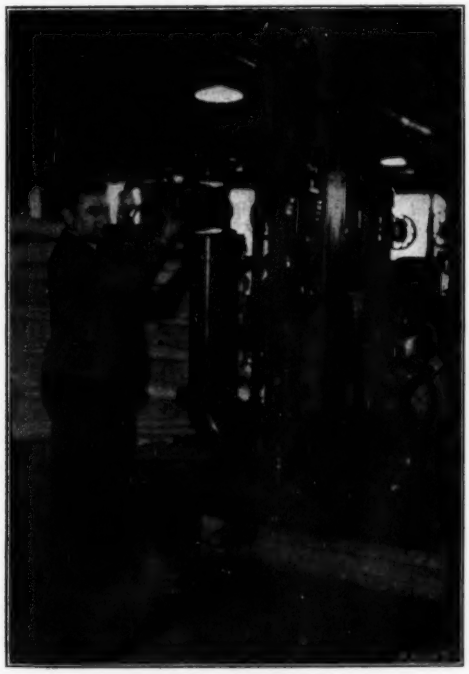


FIG. 33

A No. 3 RV-10 motorpump installation which handles 500 gallons per minute of white water against 55-ft. heat. (Ingersoll-Rand Co.)

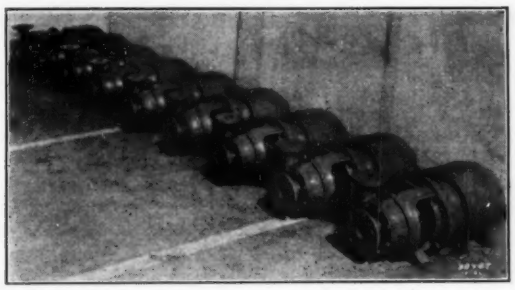


FIG. 32

Nine motorpump units with totally enclosed fan-cooled motors. (Ingersoll-Rand Co.)

The Builders Iron Company

An interesting development in flow (also level) measurement is illustrated by the Chronoflo. This instrument permits transmission of an accurate record instantaneously over long distances, utilizing ordinary telephone or similar electric circuit. When taking flow measurement the usual Venturi tube or orifice principle is employed and the long distance transmission of the mercury column levels is accomplished by a unique combination of Telechron motor, mercury switch, power relay and electro-magnetic clutch. Continuous records are automatically registered at points several hundred miles distant from the point of measurement.

The Foxboro Company

In spite of manifest advantages, continuous blowdown systems have suffered somewhat in the past through heat losses resultant from inaccurately controlled rates of blowdown. In its continuous blowdown recorder the Foxboro Company, Foxboro, Mass., now provides a permanent record and corresponding check upon performance of the blowdown system.

The Consolidated Ashcraft Company

Nitralloy, after considerable experimental work, has been selected for use on the wearing parts of pressure gauge movements such as bearings, sectors and pinions. Ordinary gauge movements lasted seventy-five minutes under a compressed air vibrating hammer test, while the Duragauge outlasted a hundred such movements and showed no signs of wear. A special alloy steel is used as a Bourdon spring. The pointer has an integral micrometer adjustment to compensate for liquid levels.

J. CONTROL EQUIPMENT.

a. Feed water regulation.

The Mercon Regulator Company

With increased pressures, flash type boilers, lessened heat capacities of furnaces, the use of pulverized fuel, oil or gas, the problem of feed water regulation introduces new complexities. No longer does it remain the relatively simple problem of maintaining constant level in the boiler, but there must be a supplementary control of feed supply whereby the latter is properly related to boiler output, unjustified peak flows eliminated and reasonably smooth and effiecient boiler operation maintained. The relative adjustment between level control and control of feed supply must necessarily be determined by the requirements of any individual case. Considerable development and study has, however, been undertaken during the past year to meet the needs of varying situations which arise. A feed water control system has been introduced whereby the differential pressure across the level regulator may be adjusted at will to accord with varying conditions of load require-

TAPPI SECTION, PAGE 87

KEITH'S

DISTINCTIVE PAPERS

●

BONDS

LINENS

LEDGERS

WEDDINGS

●

KEITH PAPER COMPANY

TURNERS FALLS, MASS.

Two Questions

that have been asked many times and

Their Answers

Question No. 1—How is it possible to make Nibroc Wytek with the strength of No. 1 Kraft and the appearance of bond?

Answer—Because Wytek is made from Brown Company's **Cellate Pulp.**

Question No. 2—Why is it that **Solka** gives papers such outstanding characteristics, such as long life—crackle—excellent appearance and fine writing surface?

Answer—Because **Solka** is a highly purified Alpha Cellulose made possible by Brown Company's secret process of purification—

Note:—

Any paper manufacturer may give his papers these same qualities by standardizing on

Solka and Cellate

BROWN Company

FOUNDED 1852

Portland, Maine

ments. This company has also developed an ingenious method of feed water regulation whereby there is substantially maintained an automatic synchronization between boiler load and feed supply.

The Smoot Engineering Corporation

Regulators are used to control the speeds of the turbine driven and variable speed motor driven feed pumps or to operate regulating valves in the discharge of constant speed pumps to maintain either constant boiler header pressures, constant excess of pressure of the feed water over the steam header pressure or lastly, a variable excess pressure in accordance with a unique idea.

This control varies the differential pressures between the steam header and the feed water header so that at low loads a low excess pressure exists correspondingly to a low boiler drum pressure and low superheater drop. As the load increases the control increases this differential in proportion to the square of the load. Thus, with double the load, the excess pressure becomes four times as great corresponding to a parallel rise in the superheater drop and pipe line friction. This means that the boiler water level regulating valves become practically fixed orifices since the fourfold increase of pressure on the feed header side of the valve will double the flow corresponding to double the boiler load. The level regulator thus only compensates for the aggregation of small inaccuracies in feed. The value of the regulation on sudden or emergency load swings is obvious.

The Swartout Company

Certain improvements in design of both differential controller and generator have been made. In the former the diaphragm is now protected against high temperatures and made more easily renewable when necessary. A generator of all steel construction has been developed with special leak-proof features. A pilot control for instantly bypassing the regulator has been provided.

b. Pressure regulation.

The Mercon Regulator Company

The importance of more dependable and exact control of process steam pressures is being demonstrated on paper machine dryers in digester service and like operations. Where an accuracy of 5 to 10 per cent of the control depressure was formerly acceptable the demand now frequently requires a variation of not over plus or minus ¼ pound throughout the full range of load requirements. This company offers a line of pressure regulators suitable for maintaining such control within a variation of plus or minus 1/10 pound and has also recently designed a system for control of differential pressure in drier sections which is claimed to improve materially on the accuracy of former conventional types.

The Bailey Meter Company

A line of relay operated pressure controllers has been recently introduced having some unique features.

The Fisher Governor Company

This company has developed a pilot valve for control of pressure at points remote from the regulator itself. The pilot valve employed utilizes the Bourdon tube principle, the deflection of the latter element serving to open or close a pilot orifice and control application of the auxiliary pressure to diaphragm of the main regulator. The pilot contains no springs or stuffing boxes and is claimed to be friction free. It is easily convertible to use in relief valve or reducing valve service. In paper machine header service a single pilot by appropriate hookup may serve for control of both the reducing valve and the relief.

The Ruggles-Klingeman Company

A pressure regulator has been introduced utilizing oil pressure acting against a spring loaded piston, the oil pressure being controlled by diaphragm operated pilot valve. This regulator also may be of constant reduced pressure or constant unloading pressure type and is particularly adapted to turbine applications where the turbine oiling system may be conveniently utilized to actuate the regulator.

The Hagan Corporation

The new controller is suitable for all pressures up to 3,000 pounds per square inch, and at 700 pounds will respond to a change of one pound, and can be adjusted to travel through its full operating range for any pressure change up to 50 pounds.

c. Boiler water level regulators.

The Smoot Engineering Corporation

A regulator for use on 1200 pound plants consists of standard regulator fitted with a water level regulating element. This element consists of a quantity of mercury contained in two communicating chambers balanced on a fulcrum. One of these chambers is connected to the variable water level in the drum and the second to a higher level constant level reservoir fed by condensation under boiler pressure. Flexible connections permit the mercury chamber casting to rock on the fulcrum and the upsetting moment created by the level difference is opposed by an adjustable spring.

As the level in the drum varies, the movement of the mercury balance is amplified by the regulator and in turn transmitted to a turbine type regulating valve in the feed line to the boiler.

The salient features of this level regulator are:—1. Its accuracy is independent of boiler pressure. 2. It will maintain boiler level within plus or minus ½ inch on all loads, and 3. It will maintain absolutely constant level at all ratings i. e., it has no characteristic of definite valve position for definite load.

The Hagan Corporation

The new receiving regulator, for actuating valves, dampers, rheostats, etc., operates under the control of the master with a single impulse line connecting them, and without the necessity of any mechanical interconnection of any kind. Both machines are fully compensated for incremental movement and are fully adjustable.

d. De-superheater Control.

The Swartout Company

With the use of By-product power comes the problem of pressure reduction and de-superheating of make-up process requirements. Many attempts at de-superheat control have not very successfully met the need for providing smooth control and uniform regulation of superheat. The method of de-superheating adopted is one wherein the main portion of the de-superheat water is synchronized with load requirements allowing an auxiliary control to govern the fluctuating needs for exact temperature regulation. This arrangement aims to materially reduce the hunting and erratic action characteristic of many past de-superheat controls.

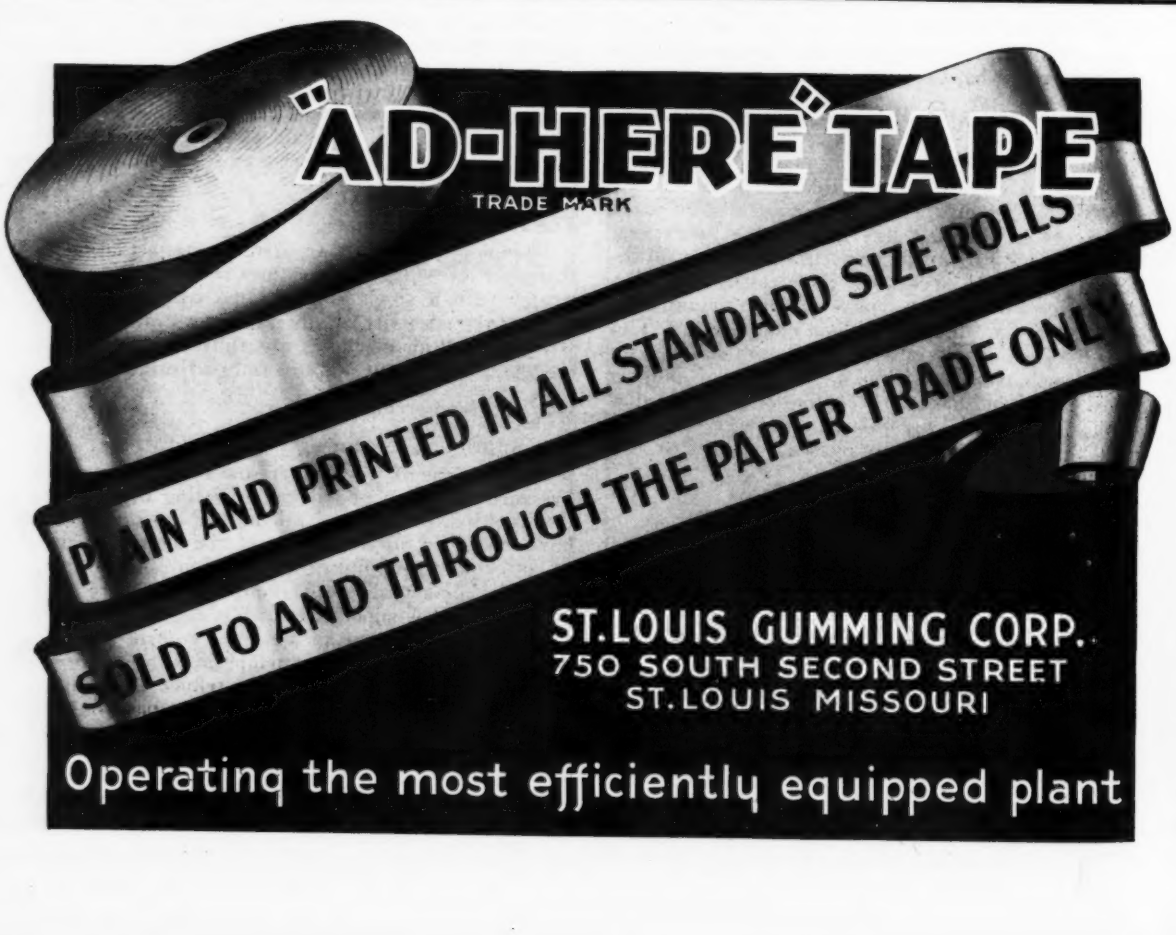
The Hagan Corporation

The corporation has installed ten pressure reducing and de-superheating equipments in the past two years

TAPPI Section, Page 88

THE MEAD CORPORATION

Founded in 1846


AD-HERE TAPE
TRADE MARK
PLAIN AND PRINTED IN ALL STANDARD SIZE ROLLS
SOLD TO AND THROUGH THE PAPER TRADE ONLY
ST. LOUIS GUMMING CORP.
750 SOUTH SECOND STREET
ST. LOUIS MISSOURI
Operating the most efficiently equipped plant

over ranges of inlet conditions from 675 pounds 850 degrees to 250 pounds 450 degrees with outlet conditions of 200 pounds 600 degrees to 160 pounds 400 degrees respectively.

A master controller responsive to the reduced steam pressure actuates the receiving regualtor which controls the venturi butterfly reducing valve, and also makes the primary adjustment of the water valve. Variations in steam and water flow are made at the same time, and the water enters at the restricted section of the valve where the steam velocity in most cases is greater than 1000 pounds per second, and is not appreciably affected by the weight of steam passing. A thermostatic control makes the secondary adjustment of the water valve to hold the temperature within the desired limits. These secondary adjustments are of small amount and a sensitive thermostat can be employed, thereby holding the final temperature within close limits.

A high pressure regulator acts as an overload protection. In case the demand for low pressure steam should reduce the high pressure below an established minimum this regulator sends a control impulse to the dual receiver which then regulates the valve to pass only the amount of steam that can be taken from the high pressure system without a further reduction of pressure.

The same arrangement can be operated as an unloader. In this case all excess high pressure steam is unloaded to the low pressure header, but in case the low pressure exceeds the desired maximum the low pressure regulator comes into action and limits the steam flow to protect the low pressure header against a further pressure increase.

During the past two years advantage has been taken of the business conditions to completely redesign its entire line of control equipment. To guard against a narrow view of this problem, engineers with broad experience on allied but non-competitive departments of this field of engineering were employed, to cooperate with our own engineers.

Each piece of apparatus has been gone over carefully and simplified and improved wherever possible, and a number of new ones developed. Jigs, fixtures, patterns, etc., have been scrapped and new ones made whenever it was possible to build a better machine than its predecessor. Fundamental principles of operation have been maintained, however, since thousands of regulators now in satisfactory service proved these principles to be correct.

The Smoot Engineering Corporation

The turbine type pressure reducing valve exactly parallels the design of the best turbine pressure governors and governor valves. A regulator is connected to the low pressure side of the valve and amplifies the pressure variations into a force sufficient to operate a pilot valve admitting oil pressure into the operating cylinder of the turbine type valve. In this way it is possible to secure extremely accurate pressure regulation and at the same time have the valve powerful enough in operation to overcome all packing friction and sticking, thereby giving smooth accurate control. The principal features of the valves are:

1. They are double seated balanced type valves with one-piece stems. The contours of the seats and discs are those of a steam turbine nozzle, hence the name of the valve, and for every change in valve position, the point of maximum steam velocity shifts, thereby spreading the wear not only around the circumference of two seats but also across a band about 1 to 1½ inches wide. This is contrasted with the ordinary V-port, type of reducing valve where the entire wear or cutting action of the steam is concentrated in the V-ports. The wear on this valve is negligible.

2. The valves are operated by an oil pressure cylinder to which oil is admitted by a pilot valve actuated in turn by a standard steam pressure regulator. This provides a double oil relay system between the steam pressure impulse and the operation of the valve. This accurate pressure regulation is secured over a wide range of steam flow with widely varying demand.

A de-superheater operates on the same principle as the automobile carburetor, the flow of the steam being utilized to produce a differential pressure utilized to force the water from a reservoir through a spray nozzle into the steam line. The de-superheater is unique in that it is inherently safe against the possible flooding of the steam line. The instant the steam flow is interrupted the water flow also stops. The de-superheater also responds immediately to steam flow changes and there is not lag in the proportioning of the steam and water due to the slow action of thermostats, etc.

e. General automatic control.

The Mercon Regulator Company

Suddenly fluctuating loads are characteristic of the paper industry and on their occurrence there is frequent need for instantaneous action involving a number of distinct operations and items of equipment. Neglecting consideration of expense, the time element alone justifies in many cases the supplanting of manual control by automatic means. Some of the problems of this type have been successfully met.

f. Automatic frequency and load control.

The Leeds-Northrup Company

Design of equipment for this service has been further improved. This has been applied successfully in the paper industry particularly to grinders permitting operation closer to maximum capacity with lessened danger of peak overloads.

The Smoot Engineering Corporation

This control acts as a supplementary governor on one or more of the units. It consists of a speed governor element driven by a synchronous motor connected to the electrical bus. This unit therefore rotates at a speed always in proportion to the bus frequency. The force of this speed governor is balanced by a spring whose tension is set to give the desired constant frequency. The movement of this speed balance with changes in frequency is transmitted and amplified by a Smoot regulator and oil power cylinder to an auxiliary synchronizing spring connected to the turbine governor.

Thus, as the frequency tends to vary, the governor reacts and by means of this auxiliary synchronizing spring, changes the main governor setting to restore the frequency. Since the added governor is isochronous, i. e., there is no relation between frequency and governor position, it will entirely remove the natural drooping characteristic of the turbine governor and give constant frequency at all loads.

The chief value of a sensitive accurate auxiliary governor of this type lies in the fact that it can be easily applied to existing units, thereby securing an improved electrical and steam regulation with a small investment and no interruption of the plant operation.

g. Flue gas controller.

The C. J. Tagliabue Company

The Tag-mono recorder measures and records both the CO_2 and the CO percentages of the flue gas, superimposing the value of the latter upon the percentage of CO_2, thereby giving in the space between the two line records a graphi-

INTERNATIONAL
PRINTING PAPERS CONVERTING

Printing Grades:—Adirondack Bond, Adirondack Ledger, Adirondack Cover, Lexington Offset, Beeswing Manifold, Saratoga Book, Catalogue, Index Bristol, Magazine, Mimeograph, Newsprint, Poster, Rotogravure, Railroad, Writing.
Converting Grades:—Bag, Book Lining, Carbonizing, Coating, Cup Paper, Envelope, Foil Backing, Groundwood Coating, Gumming, Hanging, Lithograph, Manila, News Lining, Novel News, Register, Soda Straw Paper, Tablet, Waxing.

Made by

INTERNATIONAL PAPER COMPANY
220 East 42nd Street NEW YORK, N. Y.
Branch Sales Offices
ATLANTA, BOSTON, CHICAGO, CLEVELAND, PHILADELPHIA, PITTSBURGH

Fitchburg Paper Company
Founded 1861

MANUFACTURERS OF

Fitchburg Finish

PRINTING PAPERS
AND SPECIALTIES

Capacity — 100 Tons Per Day

Fitchburg = = Massachusetts

cal picture of loss. The Tag-mono instrument for SO_2 records offers similar application in sulphur burner and roaster control.

II. Steam Distribution

A. Piping, valves and fittings

The Babcock & Wilcox Company

The Company's metallurgical staff has made a study of the use and application of alloy pipe, castings and fabricated equipment in pulp and paper mills, particularly sulphite pulp mills and is able to report that very satisfactory results have been secured through the use of these alloys in regular mill service. The studies made have emphasized the importance of selecting the proper alloy for each installation and designing parts used in such a way as to eliminate stresses which, in some cases, have induced corrosion to an unusual degree. The Company's experience in this direction has been uniformly satisfactory.

West Virginia Pulp and Paper Company

New technique in construction of steam distributing line was reported by the West Virginia Pulp & Paper Company erecting a new high pressure, high temperature steam pipe line, electrically welded.

The Edward Valve & Mfg. Company

The trend toward higher pressures and temperatures is being steadily paced by valve manufacturers. During the past year standards have been extended from 1500 WSP 750 deg. F., to 2000 WSP 900 deg. F. This company has devoted much research toward the selection and treatment of stainless steel, nitralloy, and similar alloy trim materials, directed toward meeting successfully the increased severity of service demands.

The Henry Vogt Machine Company

An attempt to minimize corrosive action is exemplified in the all stainless steel lined valve developed during the past year. This development is available up to 1350 pounds pressure 900 deg. F.

Tube Turns, Inc., Midwest Piping and Supply Company, and others.

The growing use of welded piping in the power plant directs increasing attention to its logical companion, seamless tube welded fittings. This type of piping construction offers interesting possibilities in the way of increased flow efficiency, savings in field construction costs, and improved piping appearance. During the past year manufacturers of welding fittings have devoted much effort toward modification in designs to improve flow efficiency and toward extension of the line of fittings available. Tube Turns, Inc., Louisville, Ky., Midwest Piping and Supply Company now present lines of available welding fittings which substantially duplicate the conventional line of flanged types. With the use of welding fittings there remain numerous applications which require jointure of the welded piping with flanged construction. Flanged welding fittings and stub welding fittings of Vanstone type are being offered to meet this need. The National Valve and Manufacturing Company of Pittsburgh offers a butt weld stub and lap weld stub of such type. One unique and recent development in the line of welding fittings is exemplified by Weldolets and Thredolets as produced by the Bonney Forge and Tool Works of Allentown, Pa. These types of fittings are particularly adaptable to field construction work, obviating the necessity of templets and accurate pipe cutting and facilitating unusual strength and a freedom from turbulence and pipe friction.

The C. J. Tagliabue Company

An ingenious thermostatic trap has recently been introduced. For this the manufacturers claim an ability to control discharge of condensate at a constant temperature differential below steam pressure. The device is compact, readily accessible, and permits adjustment of the temperature differential as desired.

The Fisher Governor Company

An inverted bucket trap class S.T. recently introduced features an adjustable valve post and positively guided valve. Construction is rugged, compact and readily accessible.

B. Accumulators.

C. Heat exchangers.

The Henry Vogt Company

Improvement in heat exchanger design during the past year has featured more substantial construction, special designs for particular service conditions, and facilities for easy dismantling and cleaning. In Lock forged unit all circumferential joints are mechanically locked in place by upsetting the ends of various cylindrical parts in a hot roll forging machine. The construction eliminates dependence on welding for strength in the circumferential joints. Units of the type are available in sizes up to 36 inches in diameter and pressures up to 400 pounds.

The Babcock & Wilcox Company

This company in conjunction with the Kimberly Clark Corporation, has developed a very efficient heat exchanger which is used with the Babcock & Wilcox, Kimberly-Clark forced circulating and external heating system for cooking sulphite pulp. The heater, which is used for external heating the sulphite liquor by means of steam, is of the two-pass design and employs alloy tubes, tube sheets, inside top-head, and base. The shell and outside top-head are of steel. The heater is of the dead-end type, and can be designed to use exhaust steam at from 17 to 30 pounds per square inch pressure to start the cook finishing with higher pressure steam or can be designed to work throughout with steam up to 140 pounds per square inch. An effective method of condensate recovery provides for the return of the condensate to the boiler. An automatic alarm-system gives warning when a leak occurs, preventing the possibility of any acid entering the boiler with the condensate. The application of this heater has been proved to be economically justified, as very definite savings are effected by its use.

III. Steam Power

A. Turbines.

a. Paper machine drive.

De Laval Steam Turbine Company

Steam turbines are being widely introduced for driving paper machines, as the clean exhaust steam can be utilized in the paper drying or other processes and the power is obtained at a very small net expenditure of heat. By the use of speed reducing gear, the steam turbine may generally be coupled directly to the paper machine, with either single or double end drive, thus saving not only the cost but also the losses of an electric generator, transformer, wiring and motors. Where a properly designed governor is employed, the speed regulation of turbines is extremely close, which is a most important factor in paper making; and where variable speed is required, the regulating equipment is less costly.

For variable speed control of steam turbines, the fly-ball or centrifugal governor, running at constant speed but

TAPPI Section, Page 90

THE CHILLICOTHE PAPER CO.

CHILLICOTHE, OHIO

Manufacturers of

English Finish and Supercalendered Book Paper
Plain and Fancy Finish Offset and
Lithograph Papers

LOGAN and ADENA BRANDS
Papers of High Quality

New York Office
41 Park Row

CHAMPION-INTERNATIONAL COMPANY

LAWRENCE, MASSACHUSETTS

Manufacturers of

High Grade Surface Coated Papers

MILLS AT LAWRENCE, MASSACHUSETTS

Enameled Book a Specialty

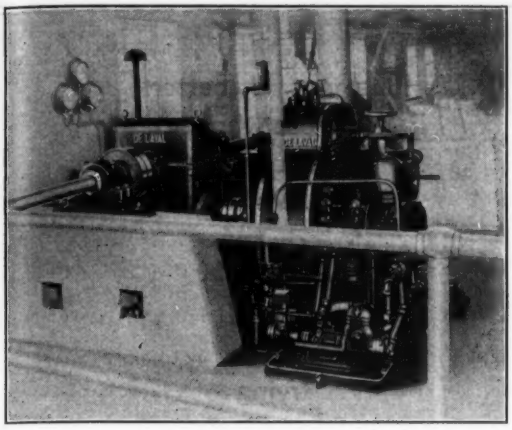


FIG. 34
Paper machine drive turbine with long range variable speed conveyor. (De-Laval Steam Turbine Co.).

driven from the turbine shaft through a variable speed transmission, has been used, and has the advantage that the forces available for governing are approximately the same at all turbine speeds. The variable speed transmission, however, is expensive, more or less cumbersome, and has other defects of friction transmissions.

A new form of mechanical variable speed governor, which is positively driven through gears from the turbine shaft and which acts directly on the steam control valve, has been developed by the De Laval Steam Turbine Company, and is shown in the accompanying photograph (Fig. 34) of a turbine and worm reduction gear supplied by that company to the Gilbert Paper Company for driving a paper machine. At full speed, the turbine, which is designed to operate on steam at 250 lb. pressure and 125 deg. F. superheat, runs at 5040 r.p.m.; while the slow speed gear shaft turns at 288 r.p.m.; the relatively large speed reduction making possible good turbine efficiency even at reduced paper machine speed.

However, the speed of the gear shaft may be regulated and held closely at any point between 288 r.p.m. and 72 r.p.m., by means of a small handwheel, which is to be seen at the top of the governor casing in Fig. 34. An indicator which registers on a scale immediately below the handwheel, shows the speed of the driven machine. Speed adjustments up to a total range of 16 to 1 are possible. The new governor is of simple construction and, at the same time, powerful and accurate throughout the entire speed range, and can be arranged either for adjustment at the turbine or by remote control.

The speed governor actuates a balanced, double-seated steam admission valve through levers, as may be seen in the photograph. The speed governor valve, as also the emergency overspeed shut-off valve, is contained within a housing formed in the turbine case cover. The valve port communicates directly with a steam chest formed in the casing cover; these, with the nozzles in which the steam is expanded, being the only parts of the turbine coming into contact with the steam at high pressure and high temperature. The emergency over-speed governor gear may be seen, in part, at the right-hand side of the turbine casing, and includes a trip handle by means of which the turbine may be shut down.

Turbines equipped with these variable speed governors are available for high and low steam pressures and for high superheat, and in horsepower ratings up to those required for the largest paper machines.

General Electric Company

It is extremely important that no speed variation occur which will cause breakage or change in weight of the paper. For this service, there has been developed a sensitive fluid pressure governor, with long range variable speed control features, which meets these exacting requirements and is positive in its action.

Speed changes are detected by a fluid mechanism, (Fig. 35) consisting of a direct connected fluid pump, a speed regulating by-pass valve, and a spring loaded fluid pressure syphon, which operates through a pilot valve to change the throttle opening. Stability is given to the governor by a restoring mechanism, which resets the pilot valve after a change occurs in the throttle opening. Under varying load and steam conditions, this restoring mechanism will cause the turbine to operate with customary regulation. Compensation has been made for this characteristic by the introduction of an oil dash-pot and double acting centering spring.

Under rapid changes of throttle openings, these devices allow the restoring mechanism to operate in the usual manner for speed stability, but for slow changes, the restoring mechanism is inactive. Since changes occur slowly under average paper-making conditions, the restoring mechanism seldom functions; hence constant speed is obtained for all throttle openings.

Since there is but one position of the fluid pressure syphon for all throttle openings, changes in initial pressure, superheat, back pressure, or other causes of speed change are made ineffective within the capacity of the unit. If the fluid is subject to temperature changes, the viscosity is kept constant by thermostatic control to eliminate the speed variations from this cause. In addition, the construction allows desirable features to meet special operating conditions such as speed control from a remote point to be incorporated at reasonable cost. A solenoid tripping device can also be added so that the turbine may be shut down from a remote point by the operation of a push button.

Automatic frequency and load control has been applied to both large and small power systems. Two types of equipment have been developed; that for the industrial plant is referred to in the following.

The illustration, Fig. 36 shows charts of load and frequency, indicating very fine regulation of frequency with

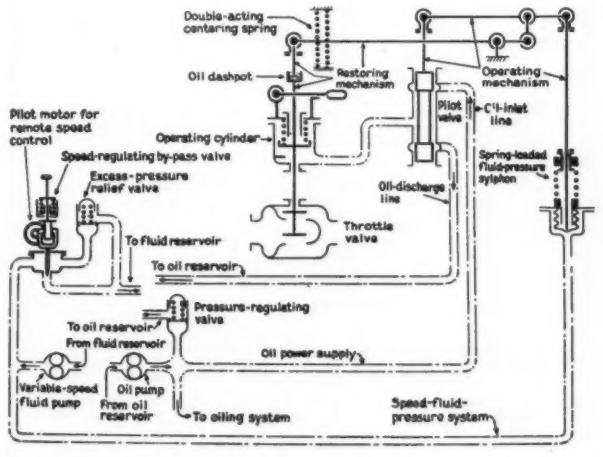


FIG. 35
Diagram of sensitive flood pressure governor with long range variable speed control features. (General Electric Co.).

14

of the

LEADERS

among

EAGLE-A PAPERS

representing

Quality • Value

Painstaking manufacture

Coupon Bond
Contract Bond
Acceptance Bond
American Embossed Cover
Herculean Cover
Riverdale Cover
American Eggshell Text
Account Linen Ledger
Acceptance Ledger
Penpoint Mimeograph
Delta Mimeograph
Quality Manifold
Dickinson Offset
Darien Index Bristol

DISTRIBUTION IN EVERY LARGE CITY

MARK OF QUALITY-STANDARDS

AMERICAN WRITING PAPER COMPANY

INCORPORATED

HOLYOKE - MASSACHUSETTS

Business is better for those who try to make it better. We have found trying worthwhile and shall keep on trying

SERVICE PRODUCTION NASHUA QUALITY

Coated Papers
Velour Papers
Metallic Papers
Embossed Papers
Trade Mark Papers
Gummed Papers
Gummed Tape
Waxed Papers
Rolled Leaf

NASHUA GUMMED AND COATED PAPER COMPANY

Nashua, N. H.

Mills at:

Nashua, New Hampshire **Peterboro, Ontario, Canada**

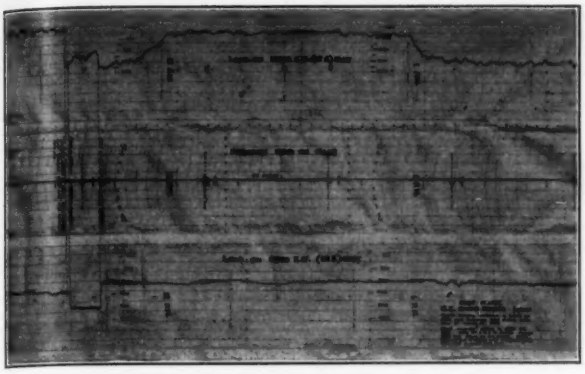


FIG. 36
Automatic frequency control records showing variations in loads and frequency held. (General Electric Co.).

a variable load. This result is accomplished with a supplementary steam turbine governing device.

In this case a 10,000 kw. turbine is operating in parallel with two 6000 kw. turbines. The chart shows the load on the 10,000 kw. turbine increased from 2000 kw. to 9500 kw. and after variations reduced to 3000 kw. with a total variation in frequency of two-tenths of one per cent.

By the addition of a small amount of material, this device can also be made to hold constant time.

Load regulating equipments applicable to generating plants operated in parallel with public utilities have been developed which can hold either source of supply at a constant value, allowing the load variations to be absorbed by the other source. When power peaks are measured by demand meters, limitation of peaks can be effected which tends to reduce excess demands.

B. STEAM ENGINES.

C. CONDENSERS AND AUXILIARIES.

Ingersoll Rand Company

In general there has been a marked reduction in ratio of condensing surface to kw. of prime mover. Over 1,000,000 sq. ft. of this company's single pass condensers serving turbines of 30,000 kw. and over have averaged .7 square feet per kw. This is to be compared with the standard a few years ago of about 1.6 square feet per kw. Part of this is due to reduction in steam per kw. due to greater turbine efficiency, higher boiler pressures and extraction. The major portion of the decrease is due to the great increase in condenser efficiency.

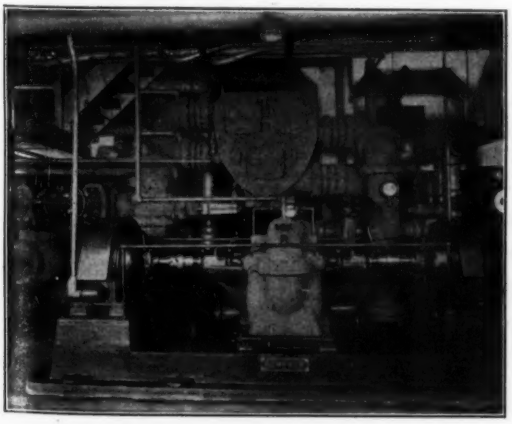


FIG. 37
Two-pass two-compartment condenser. (Ingersoll-Rand Co.).

Reduction in the number of passes called for in specifications is notable.

In the smaller sizes (1000 to 5000 kw.) the past standard of about 2 square feet per kw. has been replaced by the new standard of about 1 square foot. The average of several hundred of this size shows an average of 1.07 square feet per kw.

In addition to the heart shape condenser advocated because of its improvement in surface efficiency, the Ingersoll Rand Co. favor external devaporizers and air coolers on the basis that devaporization and cooling of air is an entirely different process from that of steam condensation.

A combination of external cooler, inter and after condenser using counter flow cooling water and two stage steam jet vacuum pump form the last stages of this type of condenser.

Paper mill work sometimes requires filtered water for a number of processes. Due to the chemical reaction, the filtered water cannot be used at temperatures below 60 deg. F. In order to obtain the most efficient heat cycle in these plants, it has been found advantageous, in many cases, to run the filtered water through a condenser serving the turbo-generator unit. In passing through the condenser, the water picks up heat from the exhaust steam, thereby raising its temperature the required amount. (Fig. 37). The condenser is sprayed with cork composition for heat insulation purposes. Two independent two-pass water circuits are used—one circuit carrying the filtered water and the other circuit carrying raw cooling water, which is used to improve the vacuum above the point which would be possible with the limited quantity of filtered water.

IV. Hydraulic Power

A. DAMS, FORE BAYS, RESERVOIRS, ETC.

B. PENSTOCKS, GATES, VALVES, MECHANICAL RACK RAKES.

Newport News Shipbuilding and Dry Dock Company

During the last few years there has been a general tendency to use butterfly valves in the penstocks adjacent to the turbines in preference to other types. This has been due to improvements in design which have reduced the head loss through the valve while in operation and have reduced the leakage loss while closed. The cost of a butterfly valve is also somewhat lower than the cost of valves of other types.

Mechanical rack raking devices have been gaining in favor. Approximately seventy-five plants in this country are now equipped with these machines. These include such plants as Osage, Conowingo, Spier Falls, Diablo Dam, Baker River, Norwood and Fifteen Mile Falls.

C. TURBINES, WATERWHEELS, GOVERNORS.

Newport News Shipbuilding and Dry Dock Company

The following units were placed in operation during the year:

One single vertical steel plate spiral casing turbine for the Bureau of Reclamation, Prosser Power Plant, Yakima Project, Washington. This unit is of the fixed blade propeller type and is rated 4200 hp., 200 r.p.m., 40 foot head.

One vertical cast steel spiral casing turbine, rated 21,000 hp., 428 r.p.m., 515 foot head, for the Sanfrancisquito Plant No. 2 of the City of Los Angeles, California, placed in operation September, 1932. This is the third and last unit to be installed in this plant. A 30-inch governor operated pressure regulator was furnished with the turbine and arranged to operate either water saving or as a synchronous by-pass valve. A 72-inch butterfly valve is installed at the turbine casing inlet. The disc and housing of the valve are both provided with renewable bronze seat rings. The disc seal ring is of the self-adjusting type.

H·T
BRAND

COATING CLAY · HIGHEST GRADE FILLING CLAY

The Clay of Uniformity

AMERICAN MADE
for AMERICAN TRADE

Edgar Clays are the Result of more than fifty years' experience in washing clay — used by Leading Paper Mills.

Also Manufacturers of **KLONDYKE BRAND FILLER CLAYS**

EDGAR BROTHERS COMPANY
50 CHURCH STREET NEW YORK CITY

WHAT YOU WANT
JUST WHEN YOU WANT IT

COMPLETE — AUTHENTIC — RELIABLE INFORMATION
Relative to Every Pulp and Paper Mill on This Continent Is to Be Found in the

1933 EDITION
58th CONSECUTIVE ANNUAL EDITION

LOCKWOOD'S DIRECTORY
of the
PAPER & ALLIED TRADES

ORDER YOUR COPY NOW

THE MANY CHANGES LISTED IN THE 1933 EDITION MAKE PREVIOUS EDITIONS OBSOLETE. PRICE $7.50 DELIVERED.

Special Traveler's Pocket Edition

bound in a flexible cover, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order)

Published by

LOCKWOOD TRADE JOURNAL CO.
15 W. 47th St. NEW YORK, N. Y. U. S. A.

The nine 84,000 h.p units for the Dnieperstroy Plant in Russia were completed and the final shipment made in May, 1932. The fifth unit was placed in operation in September. Each of these units will develop over 100,000 hp. at full gate, the largest capacity of any units yet constructed. The erection work in Russia has progressed very satisfactorily under the direction of four erecting superintendents furnished from our shop personnel.

We have been developing a new type of propeller turbine in which the runner vanes are adjusted entirely by the water flow. No interconnection is required between the runner vanes and the governor which actuates the wicket gates in the usual manner. The movement of the runner vanes is entirely automatic. Adjustment of their angular position is accomplished to suit the head as well as the load.

Baldwin-Southwark Corporation, I. P. Morris Division

During the present year there have been very few, if any, new contracts for hydro-electric turbine installations of major size. There have been, however, several plants of major importance installed and started up during the present year, as described hereinafter. During the year 1932, however, considerable time has been devoted by our Company to experimental and research work, particularly in connection with new types of turbines proposed.

With respect to the installations made during the current year, the most interesting and important one is undoubtedly the large turbines installed in the Safe Harbor Development of the Safe Harbor Water Power Corporation on the Susquehanna River. Six turbines of this type were ordered by the Power Company, three from the I. P. Morris Division, Baldwin-Southwark Corporation, and three from the S. Morgan Smith Company at York, Pa. Four of these units (two furnished by each of the above companies) were put into commercial operation the early part of this year.

These turbines are rated at 42,000 hp. under a head of 55 feet at a speed of 109.1 r.p.m., these being the largest ones of the adjustable runner blade or Kaplan type so far installed on this continent, and are among the major installations of this type undertaken up to the present time. Fig. 38. Each runner has five vanes automatically adjusted by means of a revolving operating cylinder, so that the runner vanes are automatically adjusted to the correct position for each different guide vane opening so as to develop the maximum possible efficiency at each load. This type of unit results in a very flat efficiency curve or in a high efficiency over a wide range of power. Fig. 39. It also has the advantage over the former type of fixed runner blade turbine or Francis type turbine, in that very much greater powers can be developed at reduced head conditions.

FIG. 38

Shop assembly of adjustable blade runner and cap blades in open position. (Baldwin-Southwark Corp., I. P. Morris Div.).

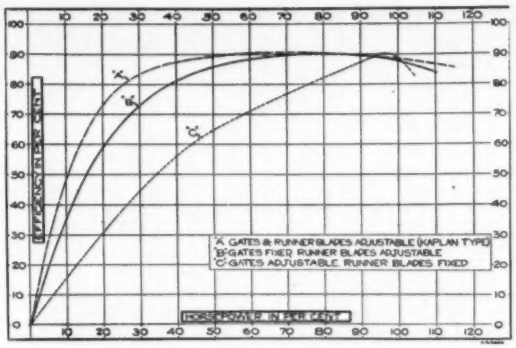

EFFICIENCY IN PER CENT
HORSEPOWER IN PER CENT
A GATES & RUNNER BLADES ADJUSTABLE (KAPLAN TYPE)
B GATES FIXED RUNNER BLADES ADJUSTABLE
C GATES ADJUSTABLE RUNNER BLADES FIXED

FIG. 39

Comparative efficiency curves of various type of adjustable gate or runner turbines. (Baldwin-Southwark Corp., I. P. Morris Div.)

Another installation of this same type, but smaller in size, was also put into successful operation during the present year. These units were furnished for the Beebee Island Corporation's Plant at Watertown, New York. In this plant are installed one adjustable blade turbine of the Kaplan type, rated at 5700 hp. under a head of 32 feet at a speed of 150 r.p.m., and a second unit of the fixed blade propeller type having a capacity of 5000 hp. under a head of 32 feet at a speed of 150 r.p.m. The combination of an adjustable blade unit and a fixed blade unit in this plant results in excellent characteristics. The above two units are furnished with rubber lined water lubricated bearings. This type of bearing has now been adopted in a great many plants, and has proven very successful.

Another large installation being erected during the present year is the Hawk's Nest Development of the New-Kanawha Power Company in West Virginia. In this plant are being installed four 35,000 hp. Francis type turbines designed for a head of 157 feet at a speed of 150 r.p.m. These units are of the vertical shaft plate steel casing type. With each turbine is furnished a 15 foot diameter pivot valve for shutting off the water. The valve disc is furnished with adjustable seal rings for reducing the water leakage when in the closed position.

For low head installations, an interesting type of unit has recently been developed comprising an adjustable blade runner, combined with fixed axial flow guide vanes. This results in a very simple and inexpensive type of installation but with characteristics well suited to the requirements of small and intermediate size developments. Even though the guide vanes of this unit are not adjustable, extremely flat efficiency curves are secured, the performance curve being only slightly inferior to the more expensive units furnished with movable guide vanes, as well as adjustable runner blades.

During the present year there have been additional installations of the Kerr-"automatic operator" furnished by this company. Among its many other functions, this equipment can be used to automatically maintain constant frequency at a given station or over a network of interconnected systems. The "automatic operator" in no way in-

For

Thin Letterheads

Records - Forms

Recommend

Fidelity Onion Skin

—or—

Emco Onion Skin

Save Postage

and Filing Space

ESLEECK

MANUFACTURING CO.

TURNERS FALLS, MASS.

LOCKWOOD'S DIRECTORY

OF THE PAPER AND ALLIED TRADES

1933 EDITION

CORRECTED UP-TO-DATE

CONTENTS

Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

City Addresses of Mills and Mill Supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufacturers
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
Paper Bag Manufacturers
Paper Box Manufacturers
Paper, Wood Pulp and Chemical Fiber Mills of the United States, Canada, Cuba, Mexico and South America
Paper Specialties Manufacturers
Papeterie Manufacturers
Prepared Roofing Manufacturers
Rags and Paper Stock Consumed by the Paper Mills
Statistical Table of Mills
Tablet Manufacturers
Tag Manufacturers
Toilet Paper Manufacturers
Trade Associations
Twine Manufacturers
Vegetable Parchment Manufacturers
Wall Paper Printers
Water Marks and Brands
Waxed Paper Manufacturers

1,000 PAGES

of USEFUL INFORMATION

Traveler's Special Pocket Edition

bound in a flexible cover for use of traveling men, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order.)

Published by

LOCKWOOD TRADE JOURNAL CO.

15 West 47th Street

New York, N. Y., U.S.A.

terferes with the normal operation of the governors, but functions to always return the frequency to the normal fixed value after a load change or other disturbance has occurred.

Another function of the "automatic operator" is that of dividing the load on a given station among a number of units in the most economical manner. It also will maintain any fixed or desired loading on a given station or on a given unit in that station.

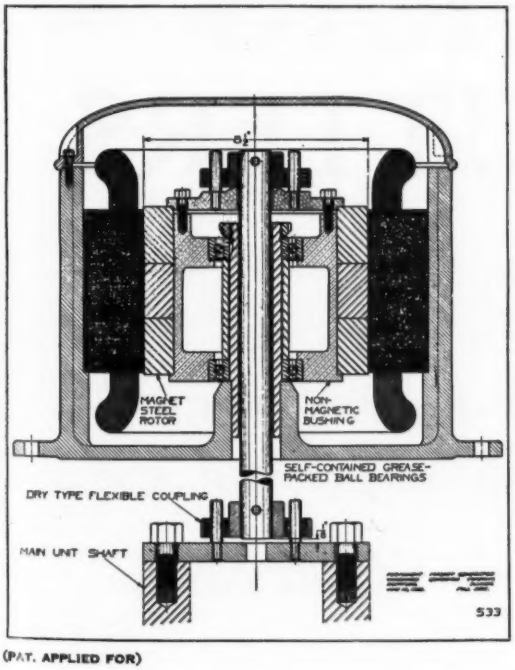
Woodward Governor Company

Simplicity, reliability, sensitivity and accuracy have gone hand in hand in our past year's development of speed governors for prime movers.

Simplicity has been accomplished by designs incorporating governor oil pump, pump motor, motor control and sump tank in one unit of pleasing appearance in place of the conventional mass of piping, tanks, conduit, etc. Certain designs require no oil piping other than the two servomotor oil lines to the actuator-governor.

Further simplicity, with added reliability, has resulted from our successful development of a small multipolar polyphase alternating current generator with permanent magnet rotating fields. This permanent magnet generator is direct connected to the turbine shaft and supplies polyphase power to the governor flyball drive motor, thereby absolutely isolating the governor from all other electrical circuits and disturbances and accomplishing what is truly a synchronous drive. Governors driven by power from the permanent magnet generators show a marked absence of improper gate movement formerly resulting from belt or gear drives or from system disturbances where the potential transformer source of flyball power is used.

The new permanent magnet generator has but one moving part, i. e., a simple ring rotor of the best permanent magnet steel mounted on liberally rated ball bearings and revolving inside of a stationary polyphase stator, which stator housing forms an oil well completely submerging both stator and rotor in a light mineral oil of good lubricating quality and high dielectric strength. Further reliability has resulted from the absolute elimination of commutators, sliprings, brushes and other forms of sliding contacts between governor drive motor and the permanent magnet generator. This construction assures long life without attention, as the only wearing parts are the two oversized ball bearings.



(PAT. APPLIED FOR)

FIG. 40

Typical permanent magnet generator for driving the governor of an 18,000 h.p. 100 R.P.M. turbine. (Woodward Governor Co.)

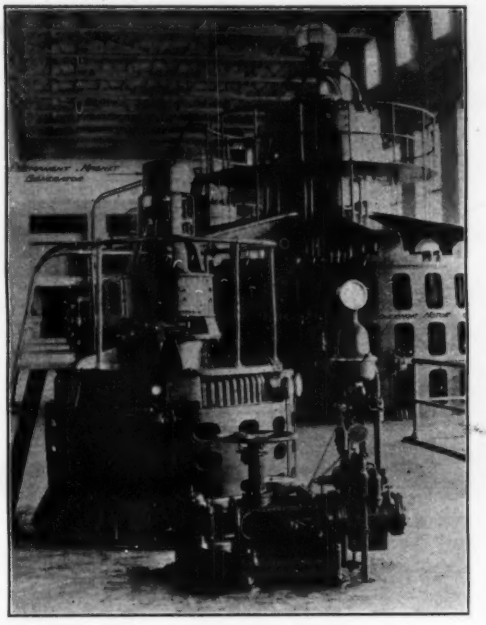


FIG. 41

Installation of a permanent magnet generator drive for a 1000 h.p., 514.3 R.P.M. house service unit governor. (Woodward Governor Co.)

Recently, unheard of governor sensitivity has been attained in the governing of several hundred thousand horsepower of hydraulic turbines, in some cases the operating engineers reporting an overall governor sensitivity of better than one one hundred and fiftieth of one per cent on a basis of normal frequency. Notable among recent governor installations are those at Spier Falls, N. Y., Safe Harbor, Pa., Camp Alexander, Ont., Ruskin, B. C., and Dneiperstroy, Russia.

During the present slack period a further complete design analysis of our governors is under way, which, no doubt, will result in still more perfect speed governors.

Fig. 40 shows a typical permanent magnet generator for driving the governor of an 18,000 hp., 100 r.p.m. turbine.

Fig. 41 shows an installation of permanent magnet generator drive for a 1000 hp., 514.3 r.p.m. house service unit governor.

D. RESEARCH AND LABORATORY WORK.

Newport News Shipbuilding and Dry Dock Company

Construction has been started on our new hydraulic laboratory which is expected to be ready for operation in March, 1933. Improved facilities will be provided for testing turbine models and component parts of hydraulic power plants under heads ranging from 10 to 60 feet. Equipment is also being provided for the study of cavitation and pitting of turbine runners. Electric dynamometers will be used.

Baldwin-Southwark Corporation, I. P. Morris Division

During the present year a considerable amount of experimental and research work has been carried on in the

Hammermill financed a national survey of business practice in the use of printed forms as tools of management.

The results of that survey were published in a series of reports and made available to Hammermill Agents, printers and business men. Then Harper & Brothers published these reports in the $3 book, MANAGEMENT CONTROL THROUGH BUSINESS FORMS.

This book contains information, facts and ideas based on the experience of men who are responsible for the management of many large corporations.

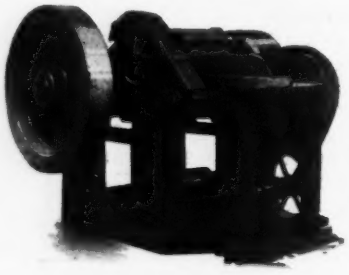
Many other business men have saved time and money by using this information. It is at your service. A copy of MANAGEMENT CONTROL THROUGH BUSINESS FORMS will be sent for $1 to any paper mill or supply man who will order it on his business letterhead.

(This offer good in U. S. A. only.)

It cost thousands of dollars to write this book *and millions to gain the experience it puts at your service.*

HAMMERMILL PAPERS

HAMMERMILL PAPER COMPANY — ERIE, PENNSYLVANIA



RAG CUTTERS

Under the TAYLOR, STILES & COMPANY GIANT REG. U.S. PAT. OFF. RIEGELSVILLE, N.J. U.S.A. Trade Mark

FOR EVERY KIND OF PAPER STOCK

ROLL BARS—BED PLATES—RAG CUTTER KNIVES

TAYLOR, STILES & COMPANY

RIEGELSVILLE, N. J. U. S. A.

laboratory located at our plant near Eddystone, Pa. Among the different lines of experiments carried on, may be mentioned the work on the development of a reversible pump-turbine unit, which can be operated either as a pump or as a turbine. A small model of such a unit, designed for relatively high heads, gave extremely high efficiencies of approximately 85 per cent when operating as a pump and 89 per cent when operating as a turbine.

Considerable experimental work has also been carried out in our laboratory on further development of propeller type pumps. Very high specific speeds and good efficiencies have been obtained.

V. Oil Engines

Ingersoll Rand Company

This concern has brought out a complete new line of heavy duty engines.

In the past few years, small Diesel engines of high rotative speed have been developed. These were applied to portable and semi-portable equipment.

In all of these developments there was a recognized low load factor with intermittent demand for full rated draft.

The recent economic conditions have permitted the small, light, high speed diesel to enter into unsound competition with the old line of heavy duty, high load factor, slow speed "plugger" type of several years ago.

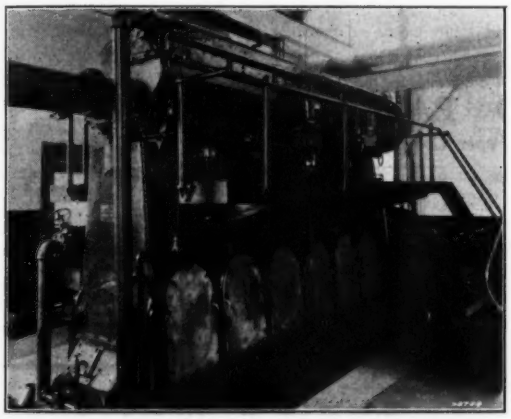


FIG. 42
750 h.p. "PR" engine. (Ingersoll-Rand Co.).

The result of this competition has lead to the study and development of a new line of engines, lighter in actual net weight than the old heavy duty, but having sturdiness and ability to operate against load factors comparable to their rating.

This new line is completely enclosed. Fig. 42. The crankshaft is short and husky and of large diameter making it free from criticals and torsional vibration. Piston pins are full floating and almost half the diameter of the piston. Undercut fillets on main bearings and crank pins permit full projected bearing area.

Solid injection, force feed lubrication throughout, improved materials, along with careful design and distribution of metals, have created an engine that is meeting the economic demand for reduced cost in Diesel plant construction and operation.

VI. Generation of Electricity

A. GENERATORS AND EXCITERS.

Westinghouse Electric and Manufacturing Company

The recent trend in generator development has been towards larger sizes and higher speeds. Large turbine generators are now operating at 3600 r.p.m. and capacities at this speed are being increased resulting in a substantial reduction in cost when compared with 1800 r.p.m. generating units. This development work however has been applied largely to central station projects; however it represents a trend which may later be followed by the paper industry. Recently considerable work has been done with hydrogen cooling of synchronous condensers and turbine driven generators. These studies have also been carried on largely by the central stations; however they represent advance ideas which may later be adopted for industrial use.

The practice of installing properly proportioned air coolers in connection with turbine generators has been almost universally adopted. By excluding dirt and foreign material from the generator windings, maintenance and repair are greatly reduced, thus increasing the reliability and continuity of service. Also when revamping old plants the use of proper generator air coolers which may be installed at the side of the generator results in the saving in basement space which is frequently at a premium. Air coolers of this type are at present being installed at the Bogalusa Paper Company and a prominent rayon company.

On turbines of larger size as for example 5000 kv-a. and above, spiral grooves are cut in the collector rings. This design has been found to materially improve the performance of the unit by reducing sparking, improving brush life and permitting of lower temperatures on the rings.

General Electric Company

A 15,000-kw. condensing turbine-generator was furnished to the City of Richmond (Ind.) which represents an increase in the size of single-cylinder 3600-r.p.m. machines from a previous maximum of 12,500 kw.

Condensing turbines of 25,000 kw., 80 per cent power-factor, 3600 r.p.m., are now under construction.

Among the instruments are an electric eccentricity recorder, an expansion recorder, an interference recorder for rotating parts that will indicate and record a squeak or other sound, a vibration amplifying recorder with detectors on each bearing, and Selsyn power amplifiers for the remote operation and indication of valves.

Welded construction is being used for certain stationary parts of steam turbines and mercury turbines and extensively in the manufacture of the equipment for the Emmet mercury vapor process. The use of x-ray inspection resulted in the development of an almost perfect welding technique which renders welded construction available for use in almost any type of service.

For the first time a turbine-generator set was designed for outdoor operation. It is a noncondensing unit for the new outdoor power station at the Schenectady works of the General Electric Company. This unit produces 6000 kw. by reducing the pressure of the 400 pounds steam in a mercury-condenser boiler to 250 pounds for use in the shops.

The principal outdoor feature is a special lagging that covers the turbine casing and bearing brackets as well as the collector rings and exciter. The bearings are equipped with sight-flow indicators located under windows in this lagging. The valve gear parts are all of noncorrodible material to withstand the effects of the weather.

VII. Distribution of Electricity

A. SWITCHGEAR.

General Electric Company

A new line of metal-clad switchgear with ratings up to 15,000 volts, 50,000 to 500,000 kv-a. (Fig. 43) is flexible in design, making it adaptable to a variety of switching

TICONDEROGA
BOOK PAPERS

TICONDEROGA TEXT
Watermarked, Laid and Wove Finish, White and Colors

TICONDEROGA EGGSHELL
(Watermarked)

SPECIAL MAGAZINE
Diamond White and India

ANTIQUE LAID
(Watermarked)

Special Cover • Legal Book • Music
Machine Finish • School Text • Strong Bulk

Made by

TICONDEROGA PULP AND PAPER COMPANY
A Division of International Paper Company

220 EAST 42d STREET NEW YORK, N. Y.

A SERVICE TO THE TRADE THAT WAS ESTABLISHED IN 1855

HUBBS & HOWE COMPANY
BUFFALO, N. Y.

CHARLES F. HUBBS & CO.
NEW YORK, N. Y.

HUBBS & CORNING CO.
BALTIMORE, MD.

HUBBS & HASTINGS PAPER CO.
ROCHESTER, N. Y.

CHARLES F. HUBBS & CO.
TROY, N. Y.

HUBBS & HOWE COMPANY
CLEVELAND, OHIO

VICTORIA PAPER & TWINE CO.
TORONTO, CANADA

VICTORIA PAPER & TWINE CO.
MONTREAL, CANADA

INTERSTATE CORDAGE & PAPER CO., PITTSBURGH, PA.

PAPER — PAPER PRODUCTS — TWINE

schemes such as single-bus, double-bus with two oil circuit breakers per circuit, double-bus with one oil circuit breaker and selector disconnecting switches, etc. The heart of the metal-clad gear is the oil circuit breaker which operates on the oil-blast principle of circuit interruption. The breaker can be operated while it is being inspected or adjusted on the inspection rack. Bolted contact joints were practically eliminated by the use of pressure welding, and silver line-to-line contact joints were used in the bus splice.

Metal-clad gear was also used quite extensively in outdoor stations by enclosing it in a weatherproof housing.

The oil blast principle was applied in the construction of some of the light duty breakers, the range now extending from 50,000 kv-a. to 2,500,000 kv-a. interrupting capacity. High speed (8 cycles) features have been added to round tank indoor as well as outdoor high voltage breakers. Round tank (3 phases in one) 15 kv, 150,000 kv-a. to 500,000 kv-a. and separate tank breaker for 500,000, 1,000,000 and 1,500,000 kv-a. interrupting capacity are now produced using the oil blast principle.

Designs of small oil circuit breakers included a new line of oil-blast breakers of 50,000 and 100,000 kv-a. interrupting rating with voltage ratings of 5000 to 15,000 volts and current ratings of 600 to 2000 amp. They may be either manually or electrically operated. (Fig. 44.)

An oil circuit breaker rated 15,000-volts, 600-amp. and 7500-volts, 1200-amp. was designed to meet the 50,000 kv-a. interrupting rating set up by the N. E. M. A. It has a separate tank for each pole and uses the brush type of current-carrying contacts, and is available for either manual or electrical operation. A pressure-brazed silver contact is used on the 1200-amp. design.

In order to meet the demand for low installation cost, quick shipment and standardization, a new line of standard small oil-circuit-breaker equipments was developed. The manually-operated units are completely assembled on steel panels, with the necessary auxiliary apparatus. They are shipped completely assembled ready for installation. The oil circuit breakers used are the standard panel-mounted manually operated breakers for 20,000-, 25,000-, and 50,000-kv-a. interrupting ratings. Additional apparatus may also include tripping relays, current and potential transformers and under-voltage devices. They can be obtained "metal guarded."

New cross-oil-blast explosion chambers were also developed for increasing the interrupting ratings of certain breakers already in service.

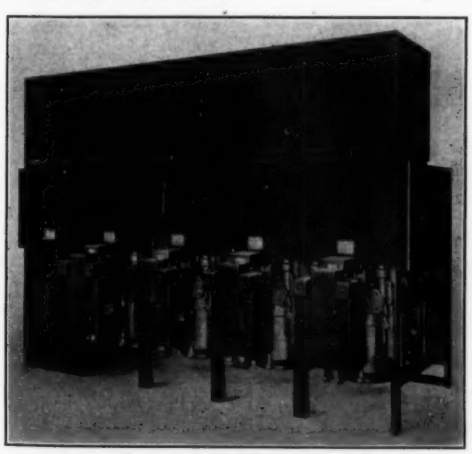


FIG. 43

Indoor metal-clad switchgear: oil circuit breaker element on inspection rack. (General Electric Co.).

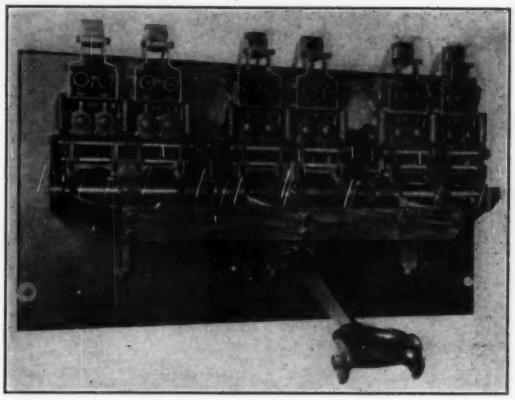


FIG. 45

6000 ampere, 600 volt AC air circuit breaker. (General Electric Co.)

Two entirely new lines of air circuit breakers were developed and improvements were made in previous standard types.

A new line of electrically or manually operated breakers (Fig. 45) was provided for the protection of apparatus and feeders, and for general application in building equipment, industrial plants, and power stations. They are rated up to 600 volts, 4000 amp. a-c., and 750 volts, 10,000 amp. d-c., and are made single-, double-, triple- and four-pole. The multi-pole breakers consist of two or more self-contained single-pole units mechanically interconnected for group operation.

Another new line of metal-enclosed multi-pole, trip-free air circuit breakers includes ratings to 600 volts a-c., 15 to 400 amp. A metal box, with cover, completely enclosed all the live parts at the front of the breaker.

Equipment for electrical operation by means of a motor-

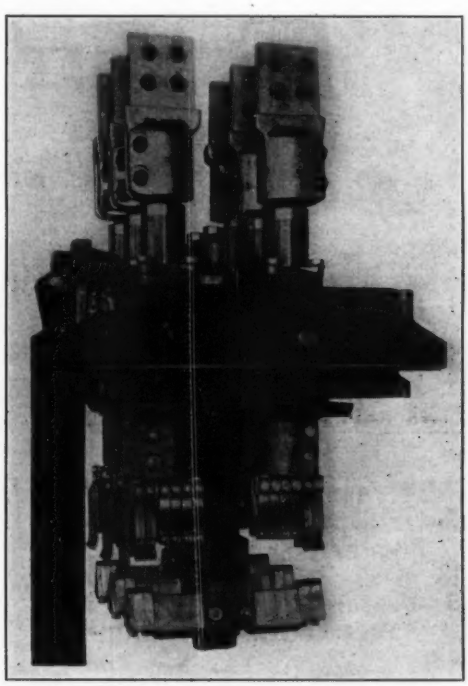
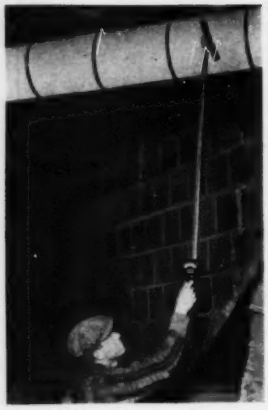


FIG. 44

Oil circuit breaker, rated 5000 volts, 2000 amperes, showing contacts open. (General Electric Co.).



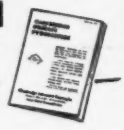
Made in HAND and EXTENSION models. Both are Rugged and Accurate.

BESIDES TAKING
DRYING ROLL TEMPERATURES

The Cambridge Surface Pyrometer is an ideal instrument for checking the efficiency of insulation. While the thermocouple contact is designed for temperature taking of moving surfaces it is just as efficient when used on still objects. This instrument is a real dollar saver . . . and produces better paper.

CAMBRIDGE INSTRUMENT CO., Inc.
3732 Grand Central Terminal, New York

CAMBRIDGE
INSTRUMENT CO INC
SURFACE PYROMETERS



Send for the details of this instrument. It will help you save money and make better paper.

ALUMINUM SULPHATE
(PAPER MAKERS' ALUM)

THE Standard Purity of this Company's product is maintained in an uncompromising degree, regardless of whether successive deliveries are from one or various of the Company's Works.

GENERAL CHEMICAL CO.
40 Rector Street, New York, N. Y.
Cable Address: Lycurgus, N. Y.
Sales Offices: Buffalo, Chicago, Cleveland, Denver, Los Angeles, Philadelphia, Pittsburgh, Providence, San Francisco, St. Louis.
In Canada: The Nichols Chemical Company, Ltd. Montreal, P. Q.

Also BAKER & ADAMSON C.P. ACIDS..REAGENTS *and* FINE CHEMICALS

Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the
OLIVER-ROGERS WET MACHINE

RAY SMYTHE, 301 PARK BLDG., PORTLAND, ORE.
Western Representative

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK
and LITHOGRAPHIC
PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

High Grade Coated Book

also

KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

230 Park Ave. New York
35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

impeller mechanism consists of a motor-operated centrifugal pump, a stationary piston, and a moving cylinder. When the impeller pump operates, mercury is forced into a space between the bottom of the piston and the cylinder head, forcing the cylinder downward, and a system of links connected to the breaker mechanism causes the operation of the breaker. The mechanism is trip-free in any position.

A new line of air circuit breaker switchboards of exceptional mechanical strength was developed for building, power-station auxiliary, and industrial service and were so designed as to be shipped as nearly completely assembled as the installation facilities would permit.

A modification of the standard alternating current recloser was developed by means of which the first reclosing impulse is given immediately after the breaker opens. The recloser can be furnished with or without this instantaneous feature, or the latter can be supplied as a separate item to be added to an alternating-current recloser which is already installed.

A simple but fast reclosing relay for use in manually operated stations gives one instantaneous reclosure only, and leaves further action to the attendant should the breaker again reopen. Its coil is energized by a switch at the circuit breaker so that the reclosing impulse is given immediately, when the circuit breaker opens.

In line with the demand for service continuity, an instantaneous reclosing feature was provided for use with the alternating-current recloser, and with the earlier design of timing relay in current-feeder circuits. It has a double-bus arrangement and selector switches and constitutes a complete substation unit.

There was a decided increase throughout the year in the use of electronic tubes for the control of a great variety of operations and, as new problems arose, they stimulated the development of tubes with improved characteristics.

A photoelectric pyrometer for the measurement of the temperature of incandescent bodies is suitable for continuously indicating or recording temperatures from 1500 deg. F. upward, and responds instantaneously to temperature changes. The equipment consists of a phototube in a specially designed housing, an enclosed panel mounting for the amplifying equipment, and an indicating or recording meter. A glow tube is included on the panel to minimize the effect of line-voltage variations.

The equipment can be adapted to the control of devices in response to temperature changes by the addition of one or more small Thyratron tubes on the panel. In use, the phototube is mounted so as to receive direct radiation from the hot body. Since the total radiant energy from a hot body varies as the fourth power of the temperature, the change in the phototube current for a given temperature change is far greater than if the energy and temperature were directly proportional.

A new "midget" photoelectric relay is applicable to most of the simpler applications such as counting, the control of limit switches, and other similar applications in which a definite light beam is intercepted by an opaque object.

The device includes a phototube, amplifying system, and a relay, all mounted on a steel base and enclosed in a drawn shell case only 5 by 7 by 5 inches. An aperture in the front of the case admits light to the phototube.

A photoelectric smoke density indicating and recording equipment for installation in the stacks or breechings of power plants utilizes a light unit and a photoelectric unit which are mounted diametrically opposite on the smoke stack, with a beam of light passing directly across the stack.

As the density of the smoke in the stack changes, the light reaching the phototube increases or decreases. The resulting change in the phototube current is amplified by a Pliotron tube and passed through an indicating or recording meter which is calibrated directly in units of smoke density. The equipment may also be arranged to close an alarm contact at any desired smoke density.

Westinghouse Electric and Manufacturing Company

Recent circuit breaker developments have practically revolutionized the art of circuit interruption during the past three years. One of the first of these developments was the De-ion air circuit breaker for circuits of 15,000 volts using the principle of the cold cathode arc and multiple gap extinguishing structure. This design has since been extended down to 2300 volts and up to 22,000 volts. The complete elimination of oil for a breaker of this voltage class has been an outstanding development and one which promises much for future safety and reduction of maintenance. The development of the De-ion grid oil circuit breaker for voltages of 50,000 to 220,000 has gone a long way towards improving the performance of circuit breakers of this class.

The De-ion grids surround the arcing contacts and consist of a series of insulating plates having interspersed plates of magnetic material all so disposed and vented that the arc is moved laterally into oil pockets where it vaporizes the oil. The resulting gas is forced through the arc stream in such a way as to deionize the arc in the minimum time with a consequent reduction in arc energy and oil deterioration.

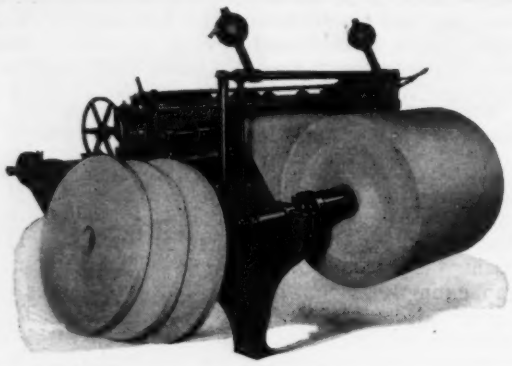
The extension of the De-ion air breaker principle to small breakers for 125 to 600 volt service has greatly increased the availability of this important development. The principle is essentially the same as for the higher voltage structures but the pole units are mounted in moulded base of Micarta. The resulting breaker is completely enclosed and in size and weight is much smaller than the corresponding carbon breaker.

The modern trend of switching practice has been towards the increasing use of the metal enclosed switchgear. The principal feature of this design is in the assembled shipment of the complete switching equipment from the factory. Field engineering and installation work is thus greatly simplified and uncertainties due to partial shipments and other shortcomings are eliminated.

Perhaps of equal importance is the safety to life which is characteristic of the metal enclosed switchgear. With this class of equipment all live parts are completely protected against accidental contact and the general overall design of this class of equipment adds greatly to the safety factor of the plant.

With violent disturbances in electrical conductors enormous currents flow and results in tremendous forces applied against bus bar supports. The development of shock absorbing bus bar supports largely eliminates the damage resulting from such electrical disturbances as the resilience of the spring mounting employed provides sufficient shock absorbing capacity to absorb the shock of these forces.

After considerable experimental and field development work an industrial type electronic voltage regulator has been developed for either a.c. or d.c. generators. These regulators employ industrial type tubes. Regulators of this type possess the characteristic speed of operation of electronic tubes with entire freedom from mechanical dashpots, linkages, bearings, etc., which are limitations of the present electro-mechanical type of regulator. Consequently the electronic voltage regulators have greater sensitivity, greater speed of response and are practically free from required attention or adjustment.



HEAVY DUTY SLITTER and REWINDER

Designed to meet the requirements of all users of Automatic Machines that take the stock from the roll, and require a roll of large diameter wound true and solid.

With this slitter, wide and narrow widths cut at the same time are of uniform tension. A roll slit and rewound 1" wide and 48" diameter can be handled without danger of spinning. At very little additional cost per ton paper mills equipped with this Slitter can furnish their customers with paper or board slit and rewound from 1" width and up. Made in three widths: 48"—60"—72".

INMAN MANUFACTURING COMPANY
AMSTERDAM, N. Y.

Manufacturers of
AUTOMATIC MACHINERY FOR PAPER BOXES AND ROTARY PAPER CUTTING MACHINERY

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

Superintendents and Executives

Our representatives will be at the Convention at Hotel Pennsylvania and will be pleased to discuss your color problems with you.

The H. & M. Trade Mark on your packages represents
QUALITY *and* SERVICE

HELLER & MERZ CORPORATION
90 West Street, New York, N. Y.

BOSTON 35 Hartford St. | **CHICAGO** 146 W. Kinzie St. | **SPRINGFIELD, MASS.** 40 Albert St.

PHILADELPHIA — South St. and Delaware Ave.
Factories—Newark, N. J. and Bound Brook, N. J.

A UNIT OF AMERICAN CYANAMID COMPANY

WAYAGAMACK KRAFT PULP
MADE AT WAYAGAMACK MILLS
THREE RIVERS, CANADA

Sulphite Pulp—Paper and Board
J. & J. Rogers Co.
Ausable Forks, N. Y.

Seagull Bleached Soda Pulp
Canadian Cellulose Co.
Cornwall, Ont., Canada

Selling Agents

THE PULP & PAPER TRADING CO.
21 EAST 40th STREET, NEW YORK CITY

B. OVERHEAD, UNDERGROUND AND INTERIOR DISTRIBUTION.

General Electric Company

The expulsion-protective gap consists essentially of a gap located within a fibre tube with openings so provided that the gases resulting from a power arc within the tube are violently expelled. As a result, the power arc is not maintained, usually being extinguished in one-half cycle. Thus by the use of the expulsion-protective gap connected in parallel with an insulator string it is possible to transfer the lightning discharge and the resulting power arc to the tube, so that the insulator string does not flash over and service is not interrupted. In practice, a gap is connected in series with the tube to prevent the continuous application of voltage to the fibre tube.

In order to check the arc interrupting ability of the device, field tests were undertaken (Fig. 46) in which expulsion-protective gaps were connected to ground through a fine fuse wire. The tests were made on a 132-kv. solidly grounded system, the circuit being closed through a circuit breaker by the oscillograph operator. Pressure measurements were taken and the tubes were tested under a variety of conditions both as to system connection and the arrangement of the tube.

About 3000 of these protective gaps are now in service on 132-kv. lines and a few on a 220-kv. line.

C. TRANSFORMERS, CONVERTERS, ETC.

General Electric Company

There were a number of power transformers constructed which, while not of exceptional capacity, are of interest from an engineering standpoint in view of their departure from previous standard practice in design, fabrication, or operation.

FIG. 46

A test of an expulsion protective gap interrupting a crest current of 6700 amperes. (General Electric Co.)

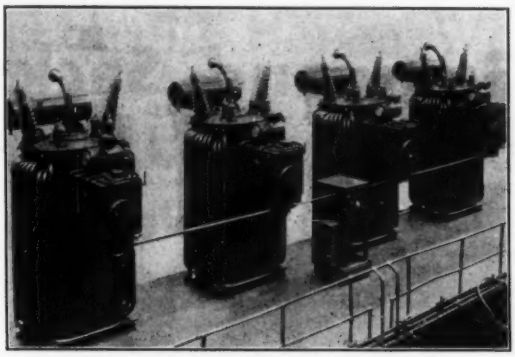


FIG. 47

Bank of load-ratio control single-phase transformers, shaft connected to one driving mechanism. (General Electric Co.)

One case of this kind covers four 1500-kv-a. power transformers equipped with full-automatic load ratio control (Fig. 47), the four transformers being operated as a unit from a common driving mechanism.

The purpose of this arrangement is to provide a spare unit which will always be in step with the other three units and ready for immediate emergency service.

In order to eliminate the possibility of oil leakage due to broken gauges, thereby minimizing fire hazards, power transformers were provided with a magnetic type of oil gauge.

A new form of swaged tube was developed to replace the ordinary tubular tanks with bent tubes. The tubes are swaged down at each end and inserted into headers, thus making a unit construction in which all the welding of the tubes into the headers can be done in fixtures before assembly of the complete unit to the tank. These units are made with from three to six rows of tubes.

A new radiator with integral headers and connectors also makes use of the swaged tubes. These new tubular tanks and radiators are not only more efficient than previous forms but have the advantage that all the welds are made on the outside so that it is possible to repair leaks easily after assembly. There are no crevices in which corrosion may take place and the tubes can be easily cleaned.

The first application of a new 50-amp. 15,000-volt load-ratio-control mechanism was made in combination with an autotransformer, both in separate compartments of one tank. The complete unit was designed to regulate a 12,500-volt 3-phase circuit through a plus or minus 10 per cent voltage range with an output of 1190 kv-a.

Westinghouse Electric and Manufacturing Company

Surge proof designs and construction are now available for all sizes of distribution and power transformers. The ability of these transformers to withstand lightning surges without either failure of the windings or without blowing of the transformer fuses is an important advance in maintaining continuity of service and reducing operating expenses.

VIII. Plan and Design of Power Plant and Distribution Systems

Nothing submitted.

Bags and Sacks
Bag Specialties
Wrapping Papers
Tissue Papers
Toilet Papers

Continental Paper & Bag Corp.
220 E. 42nd St. New York
228 No. La Salle St., Chicago, Ill.

The B. Inc. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

AMERICAN USS STAINLESS AND HEAT RESISTING STEEL SHEETS AND LIGHT PLATES

AMERICAN SHEET AND TIN PLATE COMPANY PITTSBURGH

In the Paper Making Industry

Insist upon USS STAINLESS Steel Sheets—produced in a number of grades and finishes, and adapted to a wide range of applications. Write for literature and full information on the following alloys—

USS CHROMIUM-NICKEL Steels, *Austenitic:* 18-8; 18-12; 25-12.
USS CHROMIUM-ALLOY Steels, *Ferritic:* 12; 17; 27.

USS Chromium-Nickel Alloy Steels produced under licenses of Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.

This Company also manufactures high grade Black and Galvanized Sheets, Tin and Terne Plates for all known uses.

AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Clean your felts in 1/3 the time!

A felt cleaning job that ordinarily takes 60 minutes *can be done far better in 20 minutes* using MAGNUS FELT SOAP. It saves time because this remarkable felt cleaner penetrates the felt, softens and removes the "loading" quickly and completely.

Not only does using MAGNUS FELT SOAP mean a saving in time, but a big saving in your felt bill, as well. The felts washed this way, are so clean, open and soft, that they load up again far less quickly. Thus, the felts run several days longer than usual.

If you are interested in shorter and fewer felt washing shutdowns, as well as increasing the life of your felts (and your operating profits), write for full details about MAGNUS FELT SOAP.

Send for new folder "Longer Life for your felts means greater profits for your mill."

MAGNUS CHEMICAL COMPANY
Manufacturers of Cleaning Materials
24 South Avenue Garwood, N. J.

Magnus CLEANSERS

Magnus FELT SOAP

Luncheons and Dinners During Paper Week

INSTEAD of the customary annual banquet, the American Paper and Pulp Association held a luncheon in the Grand Ball Room of the Hotel Pennsylvania, New York, on Thursday afternoon, which practically concluded the fifty-sixth annual convention of the organization. There was an excellent attendance, including representative members of the industry, who thoroughly enjoyed the *menu* provided, and the event proved a highly successful innovation.

Sidney L. Willson, president of the Association, was toastmaster, and made a very appropriate address in the course of which he discussed many problems of the paper industry. He said in part:

"Last year I said that England's abandonment of the gold standard had been called one of the greatest calamities which has ever befallen the world in peace times. Unfortunately this has proven only too true. England herself has derived but few of the expected benefits in expanded trade; on the contrary, my expressed fear that her action had caused a further slump in world trade has been proven only too true. Unfortunately for England and for us, her debasement of the currency prompted similar action by many other nations. Therefore, when currencies depreciated 35 per cent the world price level in gold fell approximately the same. Not only have American prices fallen, causing us to sell at much lower figures in our home market, but unusual and difficult problems have resulted in our own industry. The cheap currency countries find it increasingly easier to sell us. Commodities like paper, pulp, chemicals, lumber, etc., enter our ports to the detriment of our industries and labor. Our present tariffs were based on gold exchange values at par and therefore offer inadequate protection today. I therefore repeat it as my personal opinion that a countervailing duty should be imposed to nationally protect American Industry.

"The time has come for a new conception of our duties and obligations, for a re-appraisal of our responsibilities. We are the stewards of a vast economic empire whose lands and equipment within the borders of this country, can now produce annually fourteen million tons of paper and seven million tons of pulp. The mills and machinery alone represent a capital investment of about two billion, one hundred and sixty-five million dollars. The owners are a vast army of security holders who with the employees, the suppliers of materials, the transportation systems and the tax gatherers, depend directly on us for all or part of their livelihood. The users of our products include every man, woman and child in this country and many abroad. We are decidedly an essential industry and hold a responsible place in the social and economic fabric of a complex civilization.

"We can not possibly fulfill our functions as units in such a vast organism if we act singly and with selfish motives only. The consequences of one individual's act may be destructive to all of us. Assume a time when the paper mills are running at normal capacity and the price level is stable. One unit lowers quotations, and if as a result the average price level on all papers falls but thirty-one cents per hundred pounds, it means a loss to the industry of ninety-eight millions a year, or just exactly six per cent on the entire plant investment of one billion, six hundred and thirty-two million dollars. Under similar circumstances, a drop of twenty-two cents per hundred pounds on pulp, wipes out thirty-two million dollars per year or six per cent interest on the five hundred and thirty-three million dollar capital used in the pulp industry. At present operating levels, similiar price changes bring even more disastrous results. The spark in the powder mill is no more appallingly destructive. I do not advocate price-fixing. I do, however, once more urge careful consideration of all factors involved in pricing with emphasis placed on the actual costs. We have long since learned that prices do not affect by one ounce the consumption of pulp and paper as a whole. Stimulation of production to capacity is impossible by price concession, and it is axiomatic that we should get a fair return for what we do produce so that we can properly fulfill our obligations to society. Deliberately to seek less is an economic crime.

"This Association and its affiliates provide the means by which we can effectively promote our mutual welfare and thus contribute our just share to the improvement of the social system. Although we have not united all of our units into one integral whole, we can pool individual intelligence and experience into a vast fund for our combined benefit. We can not regulate prices but we can jointly determine and use accounting practices which will reveal unnecessary losses. We can secure for the Association such a standing, that financiers and private investors will consult its statistics before starting new ventures in our now over-crowded field. We ourselves can agree to refrain from expanding our plants until our present capacity is insufficient. We can abolish pernicious trade practices. We can give our industry a powerful and authoritative voice to proclaim our opinion of legislation affecting us directly and indirectly.

"In conclusion, by unselfish cooperative effort, we can set our house in order, plan intelligently for the future and thus begin to compensate for our past short-sightedness. This will require that individual opinion and action be governed only by the common good, when the majority opinion has formed and promulgated that panacea. The present necessity, as I see it, so far as Industry is concerned, is the application of Horse Sense, Co-operation and Hard Work."

Dr. Julius Klein, assistant secretary of the Department of Commerce, Washington, D. C., gave an address of a most instructive character, warning his audience that rather than emphasizing the volume of production necessary to keep their plants in full operation, they must give their first thought and consideration to the volume of profit their business must produce. He stated that the mass production had passed out of the industrial picture and the sooner manufacturers made up their minds that they would be better off to have fewer customers whose business was producing an actual profit than a vast number of customers creating a volume of production at a loss, the sooner would the industry get back on a safe and sound business basis. He proved a strong advocate for trade associations, stating the great majority of them had been of material benefit during the hard times and had helped to keep many industries on a balanced keel because of their dissemination of information of an invaluable character for the individual industry.

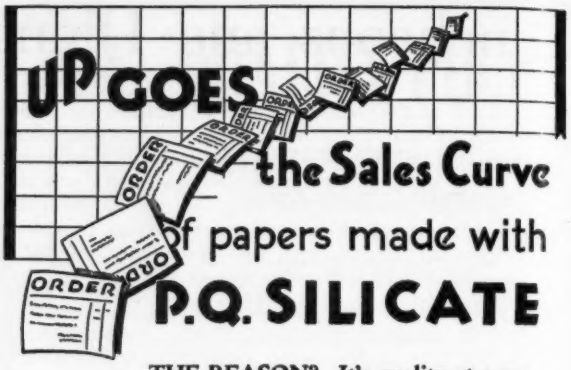
Paper Mill Supply Dealers Banquet

The Twenty-fifth Annual Banquet of the New York Association of Dealers in Paper Mills Supplies, Inc., was observed with appropriate Silver Anniversary ceremonies

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

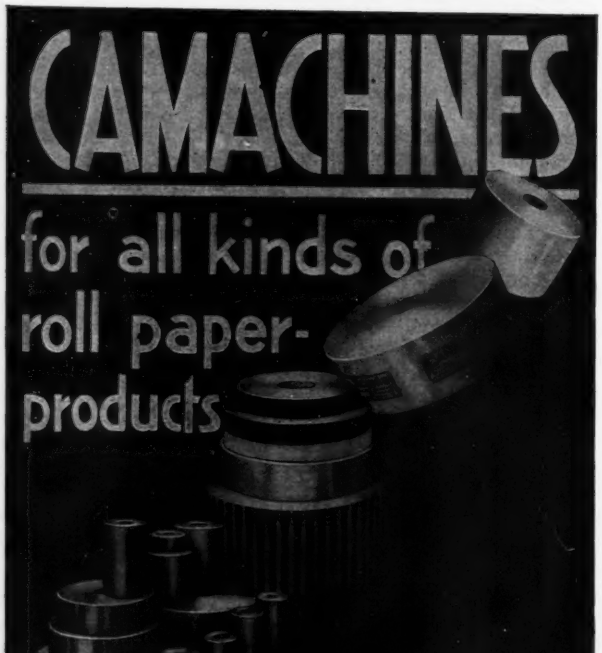


of papers made with
P.Q. SILICATE

THE REASON? It's quality at a reasonable price. Papers made with PQ Silicate have eye appeal plus serviceability. Whether it be the prevention of fuzz, the increase of rattle, improved color or strength you are seeking, you need to study PQ Silicate.

PQ plants and distributors are located conveniently to your mill. Let's talk it over.

PHILADELPHIA QUARTZ CO.
General Offices and Laboratory
121 S. Third Street, Philadelphia
Chicago Office: 205 W. Wacker Drive
Sold in Canada by NATIONAL SILICATES LTD., Brantford, Ont.



TI MACHINE STEEL
SHELL BURRS

MANUFACTURED IN
STANDARD SIZES SUITED TO
THE PAPER TRADE

We invite your inquiries

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— — WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

TI MACHINE Semi-Steel Sectional 3-4-5-6-7 Cuts per Inch — BURRS

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY
TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.
SEND FOR BULLETINS—ASK FOR PRICES

in the Grand Ball Room of the Hotel Commodore, New York, on Wednesday evening. There was a large and enthusiastic attendance of members and their invited guests, who sat down to an exceptionally good Menu and enjoyed a varied and diversified entertainment.

Before the proceedings commenced a minute's silence was reverently observed in memory of the late Fred Chase, the Grand Old Man of the paper stock trade, who had for many years served as chairman of the entertainment committee.

Tables were reserved by the following: Sol Ash, Inc.; Atlantic Waste Paper Company; Thomas Barrett & Co.; D. Benedetto, Inc., C. F. Bradley; C. J. Browne; James Carrano & Son; Darnstadt, Scott & Courtney; Economy Baler Company; Gaccione Bros. & Co.; Giove, D'Arecca & Co.; H. Goldman & Co.; Hicks, Costarino & Co., Inc.; Daniel M. Hicks, Inc.; E. J. Keller & Co.; Joe Levy & Son; Melrose Paper Stock Company; Geo. W. Millar & Co., Inc.; A. J. Moran & Co., Inc.; National Association of Waste Material Dealers, Inc.; Philadelphia Association; W. Steck & Co.; Sterling Mill Supply Company; Valva Paper Stock Company and Wilson Paper Stock Company.

The following Committee was responsible for the success of the banquet: Walter H. Martens, chairman; Charles Passannante, J. J. Patricof; Louis Leonardis, Alfred J. Moran, Lawrence W. Giove and Anthony F. Carlo.

Standardization Committee

The Committee on Simplification and Standardization of the American Paper and Pulp Association held a luncheon at the Hotel Pennsylvania on Monday. In the annual report of Chairman Robert C. Fay, it was regretted that the economic conditions had greatly hampered the committee in selling the industry on the benefits of its 1932 findings. During the past year meetings were held in Chicago and New York with the advertising managers of various mills and almost without exception these mills have indicated a willingness to make their sample books of a size to conform to the standard filing systems when the standardization file is used by enough printers.

The committee urged cooperation with the Shaw-Walker Company, which has under preparation a complete advertising and selling campaign to merchants, printers, advertising agencies and advertising managers for the sale and distribution of these files of standard grade. The committee expects no great trouble in putting over its recommendations when business improves.

National Paper Trade Association

Merchants and manufacturers gathered together in large forces at the annual luncheon of the National Paper Trade Association of the United States, held at the Hotel Pennsylvania on Wednesday. President J. F. Miller, the toastmaster, introduced the newly elected officers of the association, who were enthusiastically acclaimed.

The principal speaker was the Hon. Carroll L. Beedy, Congressman from Maine, who discussed "National Issues". He stressed the necessity of business men becoming scientifically currency minded and expressed the opinion that the remedy for the present evils was not to be found in pumping more money into channels of trade.

Mr. Beedy discussed freely the functions of the Federal Reserve Banks. He declared that the advantages achieved by the nations going off the gold standard could only be of short duration and that eventually they would be driven back.

The speaker said that the demand was growing more insistent for the Government to take some action to prevent the inroads into our great domestic market through the depreciation of foreign currencies. He favored an international agreement, with each country giving and taking something to promote the general welfare of all.

Writing Paper Manufacturers

The Writing Paper Manufacturers Association held its annual session Wednesday at the Hotel Pennsylvania. The following are the officers of the association:

President, H. R. Baldwin, Hammermill Paper Company, Erie, Pa.; Vice President, Rag Content Division, J. L. Bagg, Millers Falls Paper Company, Millers Falls, Mass.; Vice President, Sulphite Bond Division, Howell H. Howard, Maxwell Paper Company, Franklin, Ohio; E. H. Naylor, Secretary-Treasurer, 95 State street, Springfield, Mass.

The members of the Executive Committee are: H. R. Baldwin, chairman; Stuart Copeland, Eastern Manufacturing Company, Bangor, Me.; J. L. Bagg; Howell H. Howard; H. A. Moses, Strathmore Paper Company, West Springfield, Mass.; W. C. Wing, Fox River Paper Company, Appleton, Wis.; Donald M. Weston, Byron Weston Company, Dalton, Mass.

Technical Association

The 150 members and guests of the Technical Association of the Pulp and Paper Industry who gathered at lunch on Thursday, February 16, in the Banquet Hall of the Hotel Pennsylvania, were treated to not only a splendid luncheon but also considerable to feed the brain.

Dr. Walter S. Rautenstrauch, professor of electrical and industrial engineering at Columbia University talked on Technology and Social Progress. Those present then engaged in a lively discussion on economics and the ills of industry with the cooperation of Dr. Rautenstrauch.

An invitation to visit Savannah in May was extended by Dr. Herty, who told of the Spring meeting of the Georgia Forestry Association and the possibility of combining pleasure with business in attending this meeting.

Salesmen's Association

There was a satisfactory attendance at the annual meeting of the Salesmen's Association of the Paper Industry, held at the Hotel Pennsylvania on Tuesday morning. Harold R. Knott, of the Chicago office of the Eastern Manufacturing Company, was re-elected president. W. L. Raymond, of the P. H. Glatfelter Company, 200 Fifth Avenue, New York, was elected vice president in charge of the Eastern Division. Creighton W. Whiting, of the Chicago office of the American Writing Paper Company, Inc., was re-elected vice president of the Mid-Western Division; and Douglas A. Crocker of 370 Lexington Avenue, New York, was re-elected secretary.

Cardboard Manufacturers Association

At its annual meeting Wednesday morning at the Hotel Pennsylvania, the Cardboard Manufacturers Association re-elected H. W. Kramer, A. M. Collins Manufacturing Company, Philadelphia, Pa., president. The other officers are: Vice President, J. A. Moses, Falulah Paper Company, Fitchburg, Mass.; Secretary, Kenall Weyland, Champion Coated Paper Company, Hamilton, Ohio; Treasurer, W. H. Sutter, Champion Coated Paper Company.

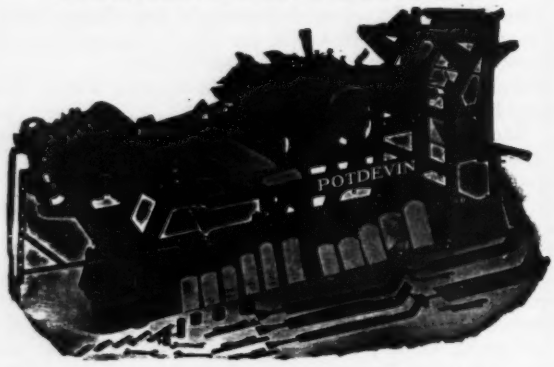
Executive Committee: H. A. Kramer; J. A. Moses and W. K. Schneider, American Coating Mills, Elkhart, Ind.

Paper Salesmen's Association

The annual luncheon of the Salesmen's Association of the Paper Industry attracted a large and enthusiastic attendance. President Harold K. Knott was an able and

NEW **POTDEVIN** PRINTING

SPECIALTY BAG MACHINERY



(Model 290) 2-Color Printing Flat and Square
40 Other Models

PAPER BAG MACHINERY

POTDEVIN MACHINE CO.

1223 38th Street, Dept. 4, Brooklyn, N. Y., U. S. A.
Phones: Windsor 1700-1701-1702

Best By Test

A NEW EDGE DEVELOPED BY

Philadelphia Felt Co.

Cylinder Top
Bottom Wet Felts

NONCURLING NONRAVELING

The edging and stitching is always an addition to and never becomes a part of the felt, hence

NO SLACK NO TIGHT EDGES

always
open and free filtering from

EDGE to EDGE

Philadelphia Felt Company
FRANKFORD, PHILADELPHIA, PENNA.
ROBERT M. GUIE, *Sales Manager*

1864 1933

"EXCELSIOR" FELTS

for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

SOLD BY
BULKLEY, DUNTON & COMPANY
75-77 Duane St., N. Y., and direct

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

efficient toastmaster. Philip A. Howard, president of the Paper Foundation, Inc., made a short address on behalf of the paper exhibit in the forth-coming Century of Progress Exposition at Chicago.

The special feature of the event consisted of a dramatized sales message staged by Professors R. C. Borden and Alvin C. Busse, of New York University. This constructive and entertaining sales message was thoroughly appreciated and applauded by all present and proved a highly successful innovation.

Sulphite Institute

Col. B. A. Franklin was the principal speaker at the luncheon of the Sulphite Institute, held at the Pennsylvania Hotel, New York, on Tuesday. He declared that "cutting prices of staple products will not create business at a time of sub-normal activity because such lowering of prices is equally made by competitive concerns." Colonel Franklin suggested the drawing up of definite trade customs where they were not already being observed in the industry generally and offered several other constructive ideas to the members present.

Cost Committee

Thomas J. Burke, secretary of the Sulphite Institute, discussed "The Pulp and Paper Puzzle" before the Cost Committee of the American Paper and Pulp Association on Wednesday morning, at the Hotel Pennsylvania, New York, and pointed out facts that prove profits can be earned by concentration on "net profits" rather than "sales volume."

Waxed Paper Association

Meetings of the American Waxed Paper Association were held at the Hotel Pennsylvania, New York, on Tuesday. The resignation of Paul S. Hanway, manager of the organization for several years, was received but no action was taken to fill the vacancy.

Gummed Industries Association

Only routine business was transacted at the annual meeting of the Gummed Industries Association, which took place on Tuesday at the Hotel Pennsylvania, New York. Douglas A. Crocker is secretary-treasurer of the Association, with headquarters at 370 Lexington avenue, New York.

The Sulphite Institute

M. G. Bakers Group of the Sulphite Institute met at the Hotel Pennsylvania, New York, on Tuesday, and discussed their business problems. On Tuesday afternoon the Bleached and Unbleached Groups of the Institute held sessions at which matters of interest to the members were threshed out.

Tissue Paper Manufacturers

An informal meeting of the Roll Tissue Group of the Tissue Paper Manufacturers Association was held at the Hotel Pennsylvania, New York, on Wednesday afternoon. C. Oliver Wellington, of Scovell, Wellington & Co., accountants, gave an address on "Suggestions for Improving Price Levels."

Forest Products Association

The Empire State Forest Products Association held a luncheon in a private dining room on the roof of the Pennsylvania Hotel on Tuesday. Various forest problems of interest to the members were freely discussed by those present.

A Constructive Message

The Hoberg Paper and Fibre Company, of Green Bay, Wis. is forwarding to its entire list of customers a specially prepared form letter which very clearly states its views on the business conditions of the past year, what is in store for us during the new year of 1933, as well as its policy of co-operating with the legitimate paper distributing trade in order to make the best possible showing regardless of the obstacles that will be encountered. The letter referred to follows:

"The year 1932, which most of us are mighty thankful is now over, will long be remembered as one of the most trying periods business has ever known.

"What 1933 has in store for us is difficult for anyone to predict at this particular time. However, one thing we are sure of is that if each and every one of us will keep foremost in our minds the many lessons the last few years have taught us, and if we continue to fight on with renewed confidence and courage, there should be no fear of the future and its consequences.

"At the present time we are facing a new business era. Many of the old methods we have used in the past will have to be discarded, and be replaced with new ones which are more adequate and in keeping with present day problems. The utmost care, however, should be exercised in selecting new methods in order to be sure that they are practical and capable of satisfactorily solving our own particular problem.

"Price has been uppermost in the minds of many buyers, and the urge for price has, in many instances, lead to such poor quality merchandise that the buying public is now demanding better quality and service. Although the demand for better quality is not sweeping the country by storm, there is a noticeable change in attitude, and we earnestly urge you to take advantage of the opportunity this movement presents.

"Like everything else that is built to endure and render a worth while service, the successful business of today must be established on a solid and firm foundation. Price alone is not sufficient to build a lasting and profitable business. Our policy of maintaining a high standard of quality has not been changed, and it shall be our earnest endeavor to improve our products rather than cheapen them in any way.

Inasmuch as the problems of the distributor and manufacturer are so closely linked together we want you to feel free at any time to call upon us whenever we can be of any help or assistance to you. Now, more than ever before, a close relationship is necessary between the successful distributor and manufacturer."

This is a constructive message which cannot fail to be favorably received by the paper distributing trade.

John Calder Leaves Wrenn Paper Co.

John Calder, for more than twenty-three years superintendent of the Wrenn Paper Company, Middletown, Ohio, has resigned and will take a well earned rest before entering the paper making business again, according to a recent report from Holyoke.

Mr. Calder has been associated with the manufacture of paper since his boyhood. He started his paper making career with A. Cowan & Sons, Inc., Penicuik, Scotland, before coming to this country in 1889. For several years he worked in paper mills in Holyoke, later going to the old Syms & Dudley Paper Co., where he remained until that company was sold.

While with the Wrenn mill Mr. Calder was credited with a great many improvements not only on the paper making machine but also on general mill equipment.

PAPER TRADE JOURNAL
ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Lynne M. Lamm,
Washington Correspondent

Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada, including tax, $7.50; Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCVI New York, February 16, 1933 No. 7

THE YEAR IN PAPER

Following the usual custom, a thorough analysis of the pulp and paper industry in North America for the past year is afforded in the annual review section of this Convention Number of the PAPER TRADE JOURNAL. Different divisions of the industry have been concisely reviewed by representative leaders of the industry in their particular fields and the information derived therefrom may be depended upon as thoroughly accurate and trustworthy. The reviews are profusely illustrated with important statistical tables and numerous graphs reproduced through the courtesy of Emmett H. Naylor, secretary-treasurer of the Writing and Cover Paper Manufacturers Association; J. A. C. Kavanagh, of the American Paper and Pulp Association; and Grafton Whiting, statistician of the Paperboard Industries Association.

While paper production in 1932 was about equal to the volume of 1923, in relation to capacity it was the lowest on record. Information gathered by the Writing Paper Manufacturers Association from all paper making machinery manufacturers indicates that six new machines with a daily capacity of 181 tons were installed in the United States during 1932. This is by far the smallest number of machines and the smallest capacity installed in the last thirteen years, since the association has been compiling these figures. Of the six machines installed, the most important was a 246 inch book machine having a daily capacity of 150 tons. The other five machines would be classified as specialty machines. Three of them, each having a daily capacity of three tons, are producing wadding. One small 32 inch machine is being used in the south for experimental work in connection with the possible production of white papers from pine. The sixth machine is 100 inch, rated at 20 tons per day for the production of art papers.

Production of news print paper declined considerably during 1932, according to the News Print Service Bureau. The total North American output was approximately 3,200,000 tons, which was 13 per cent, or 490,000 tons less than in 1931, and 1,197,000 tons, or 27 per cent less than the all time peak of 1929. The Canadian contribution to the continental total last year was a little in excess of 1,900,000 tons, that of the United States a little more than 1,000,000 tons, with outputs of 272,000 tons in Newfoundland and 13,000 tons in Mexico. Shipments during the year were in equal volume to production and total stocks at the mills at the close of the year were in only normal amount. When the year began there was a price cut of $4 per ton for news print, making the price for 1932 delivery in New York $53 per ton. As the year went on it became an open secret that the standard price was not being adhered to by all manufacturers, rebates, commissions, and other devices being used to bring down the price to the publishers. The result was that the price was cut further by $8 per ton.

The fine paper market experienced a further decline in the volume of business transacted, in common with other industries. For 1932, production of writing paper averaged 58 per cent of normal and shipments 59 per cent, representing 15 per cent and 16 per cent declines respectively from the 1931 average. The decline was more marked in cover paper, 1932 production averaging 37 per cent of normal and shipments 40 per cent, representing 36 per cent and 38 per cent declines respectively from the 1931 average. The 1932 rate of operations for writing paper was considerably above the rate of production for such heavy industries as iron and steel, cement and construction, but closely in line wit hthe rate of operations for consuming industries to which the fine paper business is definitely related.

Economic conditions severely affected the book paper industry. Throughout the year there was a constant decline in prices, brought about by efforts of the manufacturers to increase their operations, which naturally meant continued price-cutting, which has, no doubt, reached the point where prices are being quoted today at cost, or even lower. The estimated capacity of the book paper mills in 1932 was 1,862,000 tons. In that period the actual production was 1,007,000 tons, or 54 per cent of the mills' capacity. In the coated paper industry the capacity of the mills in 1932 was 168,000 tons. The production was only 89,000 tons, or 53 per cent of capacity. The prices of coated book paper suffered in the same way as prices on uncoated book paper, brought about by the same situation.

During the first six months of 1932 profitable stabilization was almost achieved by the kraft paper industry, through an intelligent balance between supply and demand at prices commensurate with costs. With the breakdown of that program, because of conditions which are well known throughout the industry, followed five months of ineffectual selling. It is probable that these deplorable conditions will of themselves bring about a better understanding of each mill's problems so that the future will bring back confidence, co-operation and some measure of profitable stabilization.

During 1932 no new paper board mills were built, but there was an increase in capacity in this branch of the industry due to improvements and greater plant efficiency. This excess capacity, it is believed, will be further augmented by increased efficiency in existing machinery. Price declines continued during most of the year, but these were not so severe as during the preceding years of the depression. As regards the future it is thought that the first six months of this year will about equal the same period in 1932 and that the last six months will witness a slow but sustained improvement.

It will be clearly seen from the reviews presented in this number that paper was adversely affected by the continued business depression, although the majority of the grades have not been so seriously affected as most other base industries. Many leaders in the industry have learned to their cost that lower quotations do not necessarily bring additional business. It is evident that each individual must consider himself a part of the picture as a whole. An important factor for the paper industry is the necessity of adjusting production to demand.

Conditions in the industry will be better in 1933 if headway is made in the difficult economic problems confronting the country.

Scott Paper Co. Makes Good Report

The Scott Paper Company, Chester, Pa., and subsidiary companies report for 1932 net sales of $8,007,190, compared with $8,816,411 in 1931, and net income of $818,405, against $997,261. Thomas B. McCabe, president, in his report to stockholders, says:

"In spite of general adverse conditions, which have severely affected the paper industry, your company is in strong position.

"Earnings available for dividends were $3.90 per share on common stock, ample to cover the dividend of $1.40 per share.

"Believing that adverse conditions called for aggressive policies, we worked to reduce costs and selling prices. At the same time, advertising was extended, and a new product was introduced.

"Combined expenditures for general advertising and the promotion of a new product were $140,000 more in 1932 than 1931, in the belief that future earnings will be substantially benefitted."

Rolland Paper Co.'s Earnings

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 14, 1933—At the annual meeting of the Rolland Paper Company, manufacturers of fine papers, a net revenue was reported for 1932 of $323,764 after all operating expenses but before depreciation. This compared with $346,876 in the preceding year.

Fixed charges, including premium on United States exchange, were earned 2.20 times. After payment of bond interest and exchange and providing $84,000 for depreciation (the same as in the preceding year), together with $90,000 for preferred dividends and $2,000 as proportion of organization expenses written off, there remained a balance of $983 to be carried to surplus account, which now stands at $313,187.

The balance sheet again shows improvement in working capital—the latter amounting to $1,071,199 as against $1,020,331 at the end of 1931.

Northern New York Mills Favor Tariff

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., February 11, 1933.—Paper mill men in Northern New York are inclined to differ relative to the recent statement of H. P. Christian, who informed the ways and means committee in the House of Representatives that the paper and pulp industry of this country would not benefit but suffer if the Hill bill for tariff revision is enacted. They contend that just the opposite would result and point out that his attitude is the same that importers, many of whom do not produce their own pulp but purchase it from others, have assumed for years to the disadvantage of the paper industry in this country. It was also pointed out that it is of advantage to American importers of foreign made pulp and paper to land those products in this country free of duty so that the domestic goods can be undersold and that inferior labor scales in European countries have enabled them to make pulp and paper much cheaper.

Mills such as those at Carthage, Norwood, Norfolk, Raymondville, Deferiet, Potsdam and Fulton were referred to in the testimony given by Mr. Christian as those that would be seriously injured by the tariff revision bill but owners of those plants are inclined to take an opposite view. It is the opinion of some that the slow growth of the pulp and paper industry in this country within the past twenty years is because of the fact that there has been no protective tariff on those products. "Just across the St. Lawrence River in Canada paper is made cheaper than we can produce it," declared a prominent mill man, "and the result has been cutting the Canadian product under our prices and removal of many concerns to that country. In European countries sulphite and other chemical pulps are made much cheaper than they can even be produced in Canada and the strenuous opposition of publishers to a tariff on foreign importations has had a serious effect on the self-contained mills, those that make their own sulphite, ground wood and finished paper."

It is contended here that a tariff on sulphite would not react favorably to the converting mills, those that buy their pulp ready made from other concerns and make it into paper, but companies like the St. Regis Paper Company, Dexter Sulphite Pulp and Paper Company, and the Racquette River Paper Company would find it beneficial inasmuch as they are the principal sufferers from the entry of the foreign pulp free of duty.

Advocates of the proposed Hill tariff claim that depreciated foreign currency has resulted in heavy losses of revenues from imports and has resulted in a fifty per cent cut in protection of American industries contemplated when the tariff duties were fixed when an entirely different rate of exchange prevailed. It is their contention that the bill will increase revenues and protect workers in this country.

Lease Mt. Vernon Straw Board Co.

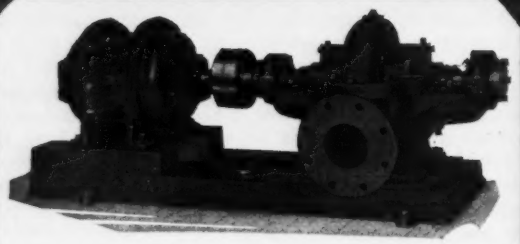
The Alton Box Board and Paper Company, of Alton, Ill., has, it is reported, leased the plant and machinery of the Mt. Vernon Straw and Paper Board Company from the Graham Paper Company, which recently became owner of the factory through a sheriff's sale.

Early operation of the plant, which normally employs a hundred men and has been idle for several months, was indicated by Paul Shortal, office manager of the Alton Box Board and Paper Company, who negotiated the lease.

The lease is understood from reliable sources to be in the form of a sale effective when the period of redemption of the Mt. Vernon Straw and Paper Board Company, resulting from the sheriff's sale, expires.

LAWRENCE PUMPS

"VORTEX" CENTRIFUGAL



FOR SEVERE SERVICE UNDER ALL CONDITIONS

Lawrence "VORTEX" Centrifugal pumps will give you a new conception of value in pumping equipment. They are of rugged construction throughout and are built for hard, continuous service and will give excellent hydraulic efficiency over a wide operating range.

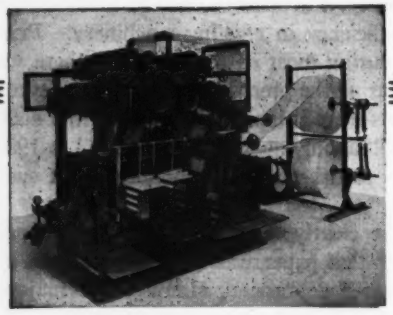
Units are compact—occupy minimum floor space. Quiet in operation.

A PUMP FOR EVERY PURPOSE

Write for Bulletins

LAWRENCE PUMP & ENGINE CO.
P. O. Box 70 Lawrence, Mass.

WALDRON *"Centennial"*



NAPKIN MACHINE

500 Completed Napkins Per Minute

Prints (1, 2 or 3 colors); embosses, folds, shear cuts and counts—all operations in sequence. No excessive wear or vibration. Speed that insures profitable production of perfectly embossed shear cut napkins. Write for Catalog 108.

JOHN WALDRON CORPORATION

MAIN OFFICE AND WORKS—NEW BRUNSWICK, N. J.
CHICAGO NEW YORK PORTLAND, ORE.

Book Papers and Specialties of the Highest Quality

TILESTON & HOLLINGSWORTH CO.

Papermakers for more than 130 Years

Amor Hollingsworth, Pres. Eugene H. Clapp, Treas.
Arthur V. Howland, V. Pres. & Asst. Treas.

MILL & OFFICES BOSTON, MASS.

SOLVAY PRODUCTS

SODA ASH
CAUSTIC SODA

Liquid Chlorine

Contract or Spot Delivery
In tank cars and multiple unit cars.
Write for Prices

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
61 Broadway New York
Boston Syracuse Chicago Pittsburgh Detroit Cincinnati Indianapolis Cleveland Philadelphia St. Louis Kansas City

* Trade Mark Reg. U. S. Pat. Off.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation
Reports
Valuations
Estimates

Paper and Pulp Mills
Hydro-Electric and
Steam Power Plants
Plans and Specifications

Hardy S. Ferguson & Co.

Consulting Engineers

200 Fifth Avenue, New York City

Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teare.....Member A.S.M.E., E.I.C., A.S.C.E.
J. Wallace Tower.....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants
Dams and other Hydraulic Structures.

Arthur D. Little, Inc.

CHEMISTS — ENGINEERS

ANALYSES AND TESTS
PRODUCT AND PROCESS DEVELOPMENT
INVESTIGATIONS
LABORATORIES AND EXPERIMENTAL PAPER MILL

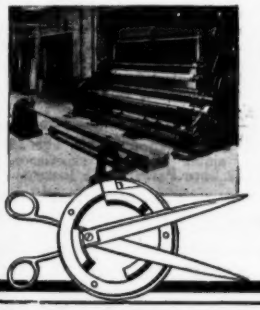
30 CHARLES RIVER ROAD . . . CAMBRIDGE, MASS.

KARL A. LEFREN, Inc.

CONSULTING ENGINEERS

171 Madison Ave. New York City

LANGSTON SLITTERS



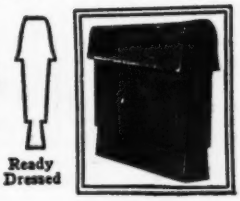
FOR clean, square-edged, tightly wound rolls, Langston Slitters are unequaled. The Shear-Cut parts the paper cleanly—instead of *crushing* it. Ask for details.

Samuel M. Langston Co., Camden, N. J.

"READY DRESSED" MILL COGS

LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL



Ready Dressed

Blank Head

WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "C" WHICH IS FREE

QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., So. Bend, Ind.

Perforated Metal Screens

for every purpose

also elevator buckets of all kinds; chutes; hoppers; stacks and tanks.

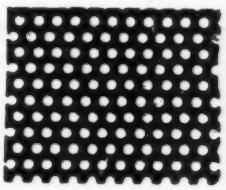
MITCO Products — Interlocked Steel Grating; Shur-Bite Stair Treads; Armorgrids.

HENDRICK MANUFACTURING CO.
50 Dundaff St., Carbondale, Pa.
Offices in Principal Cities

Perforated Metal Screens

For Pulp and Paper Mills

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS
63-65 FAIRMONT AVE. JERSEY CITY, N. J.

INTERNATIONAL WIRE WORKS

Fourdrinier Wires

MENASHA, WISCONSIN

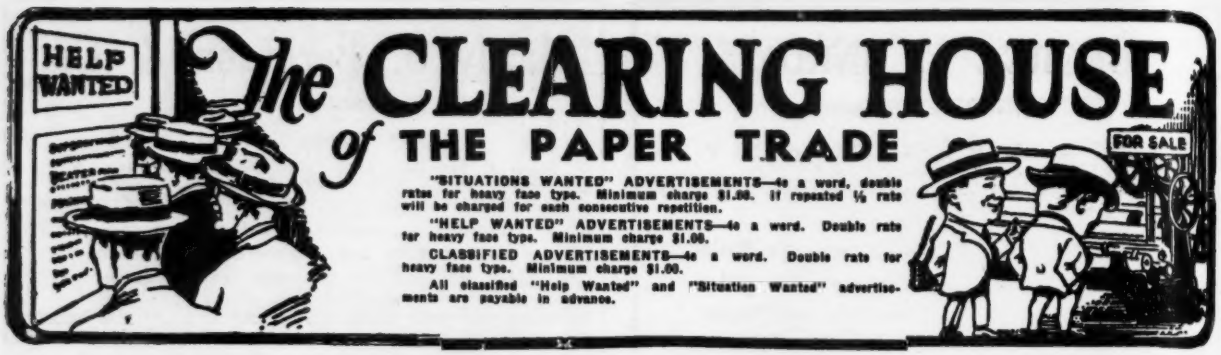
Appleton Wires

are good wires

APPLETON WIRE WORKS INC. APPLETON WIS.

PUMPS

For Every
Pulp and Paper Mill Purpose
Let Us Help Solve Your Problems
Lawrence Machine & Pump Company
Lawrence, Mass.


HELP WANTED
The CLEARING HOUSE of THE PAPER TRADE
"SITUATIONS WANTED" ADVERTISEMENTS—4c a word, double rates for heavy face type. Minimum charge $1.00. If repeated ½ rate will be charged for each consecutive repetition.
"HELP WANTED" ADVERTISEMENTS—4c a word. Double rate for heavy face type. Minimum charge $1.00.
CLASSIFIED ADVERTISEMENTS—4c a word. Double rate for heavy face type. Minimum charge $1.00.
All classified "Help Wanted" and "Situation Wanted" advertisements are payable in advance.
FOR SALE

HELP WANTED

IF YOU are open to overtures for new connections and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements, your identity covered and present position protected. Established twenty-three years. Send only name and address for details. R. W. Bixby, Inc., 117 Delward Bldg., Buffalo, New York.

OPERATING FOREMAN for converting department of large tissue mill. One who is capable and can get production on latest model toilet machine. State experience and any references. Address Box 33-72, care Paper Trade Journal. F-16

PROGRESSIVE paper company specializing in one branch of the industry intends extending its activities to fine or coarse paper field and is looking for experienced salesman that can develop business amongst jobbers and larger consumers. Right man will be unhampered and given every opportunity to produce results. Replies strictly confidential. Address Box 33-65, care Paper Trade Journal. F-16

WANTED—Experienced superintendent for Waxed Paper Plant. Must be a capable man and have a thorough knowledge of both light and heavy weight waxed papers. Address Box 33-64, care Paper Trade Journal. F-16

WANTED—experienced beater room foreman by large mill in Central West making Book, Bond, etc., papers. Must be good on colors. Give full particulars as to experience, references and age in first letter. Address Box 33-63, care Paper Trade Journal. F-23

SALESMAN wanted by old established financially sound large wholesale paper distributor. Must be experienced and have following. Preferably now employed but desirous of making a change. Liberal compensation; excellent opportunity. Replies kept confidential. Address Box 33-74, care Paper Trade Journal. F-16

SITUATIONS WANTED

GLASSINE GREASEPROOF

SUPERINTENDENT, TWENTY YEARS EXPERIENCE MANUFACTURING ALL GRADES OF GLASSINE, EMBOSSED GLASSINE, GREASEPROOF AND SULPHITE MANIFOLDS.

SPECIALIZING IN SUPER-TRANSPARENT AND GREASE RESISTING PAPERS.

GUARANTEE MAXIMUM PRODUCTION.

MINIMIZE PRODUCTION COSTS, IMPROVE MILL EFFICIENCY AND QUALITY OF YOUR PRODUCT. AVAILABLE AFTER APRIL 1ST.

BEST OF REFERENCES.

Address Box 33-56, care Paper Trade Journal M-2

SITUATIONS WANTED

EFFICIENT Board Mill Superintendent available. Years of experience manufacturing Box Board, Tag and Specialties. Construction and rebuilding old mills. References. Address Box 33-2, care Paper Trade Journal.

BEATERMAN wants position. Accustomed to mostly all grades rag or wood stock. Earl Davis, 515 East Walnut St., Kalamazoo, Mich. M-9

WANTED—Position by first class paper maker as Superintendent or assistant in small mill. Would accept other position. 25 years experience. Well up on Rope Jute Wood & Making tags bristols sack paper, insulating and other grades. Address Box 33-47 care Paper Trade Journal. F-16

SUPERINTENDENT or boss machine tender wants position. Can rebuild machines to meet requirements. 18 years experience on tissues and specialties. Best of references. Address Box 33-70, care Paper Trade Journal. F-16

BOSS FINISHER and shipping clerk. Efficient in handling help, wants position. Familiar with all grades of boxboard and paper. Also Cutters and Rewinders. Reliable references. Address Box 33-71, care Paper Trade Journal. M-2

TOUR BOSS open for position. Would consider running machine. 20 years experience running box board, Jute liner, tag and high grade sulphite. Best of references. Address Box 33-75, care Paper Trade Journal. F-23

WANTED

WANTED—An 80 inch or larger Slitter and Rewinder. Must be in first class condition. Address Box 33-58, care Paper Trade Journal. M-2

WANTED—Agency for Kraft Papers. Our territory to be the State of Kentucky. Already have Mitscherlich and Sulphite connections. Considerable volume assured. Palmer Paper Mfg. Co., 604 Washington Bldg., Louisville, Ky. F-16

WANTED—Used Flat and Square Paper Bag Machines; also Millinery Bag Machines. Address Box 33-67, care Paper Trade Journal. F-16

WANTED—4—Bird or Moore and White screens; 1—Winder about 80"; 2—Cameron Winders 42" and 72"; 1—Pony jordan; 1—60" Fourdrinier. Address Box 33-68, care Paper Trade Journal. F-23

WANTED—Paper mill with capacity of about twenty-five tons per day. Fourdrinier machines only. Give full information as to trim, beaters, etc. Address Box 33-69, care Paper Trade Journal. F-16

WANTED TO BUY—Power Paper Baler in good condition. State make, size and price. Kurtz Bros., Clearfield, Pa. F-16

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
15 West 47th Street,
New York, N. Y.

SITUATIONS WANTED

GROUNDWOOD SUPERINTENDENT with technical and paper manufacturing experience. Can improve quality, increase production, and show lower pulp costs. Address Box 33-55, care Paper Trade Journal. F-23

MASTER MECHANIC—Plant Engineer—Mechanical Engineer's degree. Charge design, construction, operation, maintenance medium and heavy machinery. Research and development drying, calendering, plating, new machines, processes; substantial savings production drying, finishing. Machine shop, foundry experience. Address Box 33-57, care Paper Trade Journal. F-23

MILLWRIGHT AND CARPENTER—Married man with 20 years experience in Paper mill work wants position. Best of references. Address Box 33-61, care Paper Trade Journal. F-23

CHEMIST—Experienced in the manufacture of entire line of high grade surface coated papers. Laboratory, plant control, research. Available at once. Anywhere. Address Box 33-60, care Paper Trade Journal. M-2

PAPER mill Draftsman available, age 35, with technical training and mill experience. Address Box 33-59, care Paper Trade Journal. F-23

MISCELLANEOUS

CLARK MANUFACTURING COMPANY, Holyoke, Mass. Telephone 2-4370. Builders of cylinder moulds, couch and felt rolls, dandy rolls. We cover dandies and cylinders tight, for fast running machines. tf

FOR SALE

PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing Laboratory Coating and Treating machines. High speed. New improvement. MAYER COATING MACHINES COMPANY, INC., Rochester, N. Y. T.F.

FOR QUICK SALE—Complete contents 81" trim 4 cylinder machine paper mill in the East, including motors, power equipment and filtration plant. Fine condition. Immediate possession. Price $7000.00. Address Box 33-73, care Paper Trade Journal. F-16

FOR SALE

1—Pusey and Jones Fourdrinier Paper Machine. Wire 104" by 65 feet. Three sets presses. 30 dryers 48" by 102". Ten roll stack of calenders. English reel.
1—Pusey and Jones Fourdrinier Paper Machine. Wire 84" by 65 feet. Three sets presses. 30 dryers 48" by 80". English reel.
1—Jones beater 61" x 48".
1—No. 2 Lannoye Pulper.
2—Millspaugh suction rolls 18" x 80" and 18" x 120" with pumps.
Machine calenders 76", 82", 98" and 104".
Hamblet cutters 40" to 102".
Seybold trimmers 44", 50", 56" and 74".

FRANK H. DAVIS COMPANY
175 Richdale Ave. Cambridge, Mass.

BUSINESS OPPORTUNITY

PAPER sales company well known in its own field and adequately financed would like to contact with some other company now selling fine or coarse papers in and around New York whose business is handicapped by lack of capital or who for various reasons is unable to get most out of its business. A connection on fair terms may prove advantageous. Address Box 33-66, care Paper Trade Journal. F-16

WANTED—Man to invest in Roofing Plant and take charge of Sales or Production. A going concern. Wonderful opportunity. Address Box 32-537, care Paper Trade Journal. F-16

WANTED

WANTED—Side lines to carry with paper specialties. Am calling on wholesale trade. Paper, Dry Goods and Drug Jobbers, also 5c to $1.00 syndicate stores. Address Box 33-62 care Paper Trade Journal. F-16

GOVERNMENT BID

TREASURY DEPARTMENT, Bureau of Engraving and Printing, Washington, D. C., February 2, 1933.—Sealed proposals are invited to furnish paper boxes, paper box blanks, and paper, during the fiscal year beginning July 1, 1933. Samples must be received at the Bureau of Engraving and Printing not later than Wednesday, March 15, 1933. Blank forms with specifications for proposals, giving dates on which the bids for the several schedules will be opened, and further information will be furnished on application to A. W. HALL, Director. F-16

TREASURY DEPARTMENT, Bureau of Engraving and Printing, Washington, D. C., February 8, 1933—Sealed proposals are invited to furnish dextrine, oils, textiles, and dry colors, during the fiscal year beginning July 1, 1933. The right is reserved to reject any or all bids or parts of bids. Samples must be received at the Bureau of Engraving and Printing not later than March 24, 1933. Blank forms with specifications for proposals, giving dates on which the bids for the several schedules will be opened, and further information will be furnished on application to A. W. HALL, Director. F-23

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
15 West 47th St.
New York, N. Y.

BUSINESS OPPORTUNITY

TOILET TISSUE MANUFACTURERS—An experienced technically trained Mechanical and Industrial Engineer, specialized in the manufacture of toilet tissues, napkins and towels has invented an inexpensive process for the manufacture of toilet tissues, that gives that product an outstanding advertising value and sales appeal. Would like to make an equitable arrangement for the use of the patent rights to this idea. Address Box 33-54, care Paper Trade Journal. F-23

HELP WANTED

GUMMED Tape Mill desires Representative for Southern States and Middle West calling on Jobbers and large consumers. Must be producer and able to furnish references. Address Box 33-76 care Paper Trade Journal. F-16

WANTED—BOSS BEATERMAN, experienced on folding and set-up box boards; State experience, age and give references. Address Box 33-77 care Paper Trade Journal. M-9

Classified Advertisements Bring Results

PERFECTION GUMMED PAPERS
All that the Name Implies
"THEY LIE ABSOLUTELY FLAT"
ASK FOR SAMPLE BOOK
WITH COMPLETE DATA AND PRICES
PAPER MANUFACTURERS CO. INC.
PHILADELPHIA, PA.

Dietz Towel Interfolding Machines
also
TOILET PAPER MACHINES
For making Toilet and Paper Towel Rolls
(With or without perforations)
AUTOMATIC TUBE MACHINES
For Making Wire-Stitched Toilet Tubes
Sanitary Crepe Towel Machines, Roll Tighteners, Slitting and Rewinding Machines, Drop Roll Slitting Machines, Photo Mount Beveling Machines, Rotary Card Cutting Machines, etc.
Correspondence solicited
DIETZ MACHINE WORKS
126-128 W. Fontaine Street
Cor. Waterloo St. (between Front & Second Sts.)
and below Diamond St.
Phila., Penna., U. S. A.

The HARRINGTON & KING PERFORATING CO.
5652 Fillmore St.
Chicago, Ill.
New York Office
114 Liberty St.
PERFORATED METALS
Screens of All Metals
For use in Pulp and Paper Mills

Gilman Paper Company
Manufacturers of
PAPER BAGS
SACKS, GUMMED TAPE
NEWSPRINT & KRAFT PAPER
Executive Offices, 475 Fifth Ave., New York
Mills and Bag Factory at Gilman, Vermont

Classified Index To Advertisers

ABRASIVES
Carborundum Co.
Norton Co.

ACID ACCUMULATORS
Stebbins Engineering & Mfg. Co.

ACID FITTINGS (Bronze)
The Duriron Co.
Murray, D. J. Mfg. Co.

ACID FITTINGS
Stebbins Engineering & Mfg. Co.

ACID PUMPS
De Laval Steam Turbine Co.
The Duriron Co.
Oliver United Filters Inc.

ACID PROOF BRICK & TILE
Stebbins Engineering & Mfg. Co.

ACID PROOF LININGS
Stebbins Engineering & Mfg. Co.

ACID SYSTEMS
The Duriron Co.
Jenssen Company, G. D.

ADDING MACHINE ROLLS
Paper Manufacturers Co., Inc.

AGALITE
Union Talc Co.

AGITATOR EQUIPMENT
The Duriron Co.
Valley Iron Works.

AGITATORS
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Moore & White Co.
Valley Iron Works Co.

AIR DRYING MACHINERY
Waldron, John, Corp.

AIR PREHEATING UNITS
Ross Engineering Corp., J. O.

ALLOY METALS
Chromium Corporation of America
Michigan Steel Casting Co.

ALLOY STEELS
American Sheet & Tin Plate Co.
The Duriron Co.

ALUM
American Cyanamid & Chemical Corp.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.

ALUM DISSOLVING JETS
Duriron Company, Inc.

ALUM DISSOLVING SYSTEM
Duriron Company, Inc.

AMMONIA, Anhydrous
Mathieson Alkali Works, Inc.

AMMONIA, Aqua
Mathieson Alkali Works, Inc.

ANALYSIS AND TESTS
Electrical Testing Laboratories.
Little, Inc., Arthur D.

APPRAISALS
Chemipulp Process, Inc.

AQUA AMMONIA
American Cyanamid & Chemical Corp.

ARCHITECTS AND ENGINEERS
Ferguson, Hardy S.
Hardy, George F.
Jenssen Company, G. D.
Lefren, K. A.
Simons, V. D.
Stebbins Eng. & Mfg. Co.

ARMORING, FLOOR
Hendrick Mfg. Co.

ASBESTINE PULP
International Pulp Co.

ASBESTOS DRYER FELTS
Asten-Hill Mfg. Co.

AUTOMATIC WATER FEEDER
Merritt Engineering & Sales Corp., The

BACKING WIRES
Appleton Wire Works.
International Wire Works

BAG MACHINES
Heinrich Inc., H. H.
Smith & Winchester Mfg. Co.

BALL BEARINGS
S. K. F. Industries
Timken Roller Bearing Co.

BARKERS
Valley Iron Works Co.

BARKING DRUMS
Murray, D. J. Mfg. Co.

BEARINGS (Tapered Roller)
Timken Roller Bearing Co.

BEARINGS
Emerson Mfg. Co.
Friction, Anti-Friction, Ball and Thrust.
Montague Machine Works.

BEARINGS (Thrust)
S. K. F. Industries
Timken Roller Bearing Co.

BEARINGS, ROLLER
S. K. F. Industries
Timken Roller Bearing Co.

BEATING ENGINES
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Valley Iron Works Co.

BEATER LININGS
Stebbins Engineering & Mfg. Co.

BEATER BED PLATES
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Taylor, Stiles & Co.
Valley Iron Works Co.

BEATER ENGINE BARS
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
John W. Bolton & Sons, Inc.
Taylor, Stiles & Co.
Valley Iron Works Co.

BEATER HOODS
Bird Machine Co.
Emerson Mfg. Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.

BEATER ROLLS
Dilts Machine Works, Inc.
Emerson Mfg. Co.
E. D. Jones & Sons Co.

BEATER STOCK RECORDER
Merritt Engineering & Sales Corp., The

BELTING
Goodrich Rubber Co.
Goodyear Tire & Rubber Co.

BELT LACING
Flexible Steel Lacing Co.

BITUMINOUS PRODUCTS
Sleight Bituminous Products Co.

BLEACH EJECTORS
Perkins & Sons, Inc., B. F.

BLEACHING APPARATUS
E. D. Jones & Sons Co.
Moore & White Co.

BLEACHER LININGS
Stebbins Engineering & Mfg. Co.

BLEACHING POWDER
Mathieson Alkali Works, Inc.

BLEACHING PROCESS
Electro Bleaching Gas Co.

BLOW PIPING
Moore & White Co.

BLOWERS (CENTRIFUGAL)
De Laval Steam Turbine Co.
General Electric Co.
Ross Engineering Corp., J. O.

BLOW VALVES
The Duriron Co.

BOARD MACHINES
Downingtown Mfg. Co.
Emerson Mfg. Co.

BOARD MACHINES (Insulating)
Oliver United Filters, Inc.

BOILER PRESERVATIVES
Magnus Chemical Co.

BRASS COLLAPSIBLE SHAFTS
Moore & White Co., The

BREAKER BEATER WATER FEEDER
Merritt Engineering & Sales Corp., The

BUCKETS (elevating)
Hendrick Mfg. Co.

BULKERS (Pressure)
B. F. Perkins & Son, Inc.

BULKING TESTERS
Testing Machines, Inc.

BUNDLING PRESSES
Paper Converting Machine Co. Inc.

BURSTING TESTERS
B. F. Perkins & Son Co.
Testing Machines, Inc.

CABINETS
Griffith-Hope Co.

CALENDER DOCTORS
Bird Machine Company
Ticonderoga Machine Works

CALCIUM HYPOCHLORITE
Mathieson Alkali Works, Inc.

CALENDER ROLLS
Emerson Mfg. Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Perkins & Son, Inc. B. F.
Textile Finishing Mchy. Co.
Waldron Corp., John

CALENDER ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Smith & Winchester Mfg. Co.
Ticonderoga Machine Works

CALENDERS
Beloit Iron Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co.
Textile Finishing Mchy. Co.

CARBON BLACK
United Carbon Co.

CALIPERS (Micrometer Roll)
Farrel-Birmingham Co.
Lobdell Car Wheel Co.

CASEIN
American Cyanamid & Chemical Corp.
The Casein Manufacturing Co. of America
Paper Makers Chemical Corp.

CASTINGS
Montague Machine Co.

CASTINGS (Acid Resisting)
The Duriron Co.

CASTINGS (Brass Bronze, Iron)
Downingtown Mfg. Co.
Smith & Winchester Mfg. Co.
The J. C. Stine Co.

CASTING (Gray Iron)
Farrel-Birmingham Co.
Smith & Winchester Mfg. Co.

CASTING (Chrome Nickel Alloy)
Michigan Steel Casting Co.

CAUSTIC SODA
American Cyanamid & Chemical Corp.
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.

CENTRIFUGAL MACHINERY (Special)
De Laval Steam Turbine Co.

CENTRIFUGAL REFINERS
Bird Machine Co.

CHEMICALS, COLORS, ETC.
American Cyanamid & Chemical Corp.
E. I. DuPont de Nemours & Co., Inc.
Electro Bleaching Gas Co.
General Dyestuff Corp.
Geigy Co., Inc.
National Aniline & Chemical Co.
Paper Makers Chemical Corp.
Williams & Co., C. K.

CHEMICAL ENGINEER
Gustavus J. Esselen
Little, Inc., Arthur D.

CHEMICAL (Pulp Mill Equipment)
Jenssen Company, G. D.
Stebbins Engineering & Mfg Co.

CHEMICAL PULPING PROCESSES
Chemipulp Process Inc.

CHEMISTS
Electrical Testing Laboratories.
Gustavus J. Esselen
Geo. D. Kratz
Little, Inc., Arthur D.
Orthmann Laboratories, Inc.

CHILLED IRON ROLLS
Farrel-Birmingham Co.
Perkins & Son, Inc., B. F

CHROMIUM IRON PLATE
Downingtown Iron Works

CHIPPERS
Murray, D. J. Mfg. Co.
Valley Iron Works Co.

CHIP SCREENS
Appleton Wire Works
Deister Concentrator Co.
Moore & White Co.
International Wire Works

CHIPPER KNIVES
John W. Bolton & Sons, Inc.
Murray Mfg. Co., D. J.

CHROME PLATE
Chromium Corporation of America

CHLORINE
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CHUCKS
John Waldron Corp.

CLAY (China)
American Cyanamid & Chemical Corp.
Edgar Bros. Co.
Vanderbilt Co., R. T.

CLEANING MATERIALS
Magnus Chemical Co.
Magnuson Products Corp.

CLUTCH PULLEYS
Moore & White Co.

CONSISTENCY REGULATOR
Merritt Engineering & Sales Corp., The

CO_2 RECORDERS
Cambridge Instrument Co.

COATING MACHINERY
Moore & White Co.
Potdevin Machine Co., The
Waldron Corporation, John

COATING MATERIALS
Paper Makers Chemical Corp.

COGS
Bowsher, N. P., The

COLLAPSIBLE WINDER SHAFTS
Moore & White Co.
Murray D. J. Mfg. Co.

COLORS & DYESTUFFS
National Aniline & Chemical Co.
Paper Makers Chemical Corp.
United Carbon Co.

COLOR MIXING EQUIPMENT
Waldron, John, Corp.

COMBUSTION CONTROL
Cambridge Instrument Co.

COMPRESSORS (Air)
General Electric Co.
Oliver United Filter, Inc.

COMPRESSORS (Centrifugal)
De Laval Steam Turbine Co.

CONSULTING ENGINEERS
Ferguson, Hardy S.
Hardy, Geo. F.
Lefren, K. A.
Little, Inc., Arthur D.
Orthmann Laboratories, Inc.

CONTINUOUS BEATER ATTACHMENTS
Bird Machine Company
E. D. Jones & Sons Co.

CONTINUOUS BEATERS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Valley Iron Works Co.

CONTINUOUS BEATER WATER FEEDER
Merritt Engineering & Sales Corp., The

CONTROLLING INSTRUMENTS
Merritt Engineering & Sales Corp., The

CONTROLS (Electric)
Cambridge Instrument Co.

CONVEYORS
Murray, D. J., Mfg. Co.

CONVEYORS (Trim)
Ross Engineering Corp., J. O.

COOKING & RECOVERY PROCESS
Ross Engineering Corp., J. O.
Stebbins Engineering & Mfg. Co.

CORES (Paper)
Climax Tube Co.
Elixman Paper Co.

CORES (Steel)
Fabricated Steel Products Co.
Smith & Winchester Mfg. Co.

COTTON CALENDER ROLLER
Perkins & Son, Inc., B. F.
Textile Finishing Mchy. Co.

COUCH ROLLS
American Wringer Co.
Beloit Iron Works
Downingtown Mfg. Co.
Emerson Mfg. Co.
Montague Machine Co.
Moore & White Co

COUPLINGS
De Laval Steam Turbine Co
Emerson Mfg. Co.

CREPING MACHINES
Beloit Iron Works
Paper Converting Machine Co., Inc.
John Waldron Corp.

CYLINDER MACHINES
Downingtown Mfg. Co.
Moore & White Co

CUT-OFF SAWS
Murray, D. J. Mfg. Co.

CYLINDER COVERS
Wisconsin Wire Works

CYLINDER, RAILROAD AND DEVIL DUSTER
Moore & White Co., The

CYLINDER DRIVES
Moore & White Co., The

CYLINDER MOULDS
Beloit Iron Works
Emerson Mfg. Co.
Glens Falls Machine Co.

CYLINDER WIRES
Appleton Wire Works
International Wire Works

DAMPENERS
Perkins & Sons, Inc., B. F.

DECKERS
Bird Machine Company
Glens Falls Machine Co.
Montague Machine Co.
Oliver United Filters Inc.
Valley Iron Works

DENSITY REGULATOR
Merritt Engineering & Sales Corp., The

DIE CUTTERS
Appleton Machine Co., The

DIGESTER FITTINGS
Duriron Company Inc., The
Michigan Steel Casting Co.
Stebbins Engineering & Mfg. Co.

DIGESTER LININGS
Stebbins Engineering & Mfg. Co.

DISPENSERS
Griffith-Hope Co.

DOCTORS
Bird Machine Co.

DOCTOR BLADES
Bird Machine Company
John W. Bolton & Sons, Inc.

DRIVES (Paper Machinery)
Beloit Iron Works
Bird Machine Co., (Pulmax Drive Div.)
Downingtown Mfg. Co.
Emerson Mfg. Co.
Farrel-Birmingham, Co.

DRIVES (SHORT CENTER)
Bird Machine Co., (Pulmax Drive Div.)

DRYER DOCTORS
Bird Machine Company

DRYERS
Beloit Iron Works
Downingtown Mfg. Co.
Emerson Mfg. Co.

DRUM WINDERS
Beloit Iron Works

DRYER FELTS
Asten-Hill Mfg. Co.

DRYING SYSTEMS
Pickles, W. F.
Ross Engineering Co., J. O.
Stickle Steam Specialties Co.
Waldron Corporation, The

DUSTING MACHINERY
Jones & Sons Co., E. D.

DYES, (ANILINE)
General Dyestuff Corp.
Heller & Merz
Geigy Colour Co., The
National Aniline & Chemical Co.

ELECTRIC EQUIPMENT
General Electric Co.

EMBOSSING CALENDERS
Perkins & Sons, Inc., B. F.
Textile Finishing Machinery

EMBOSSING MACHINES
Paper Converting Machine Co., Inc.
John Waldron Corp.

EMBOSSING MACHINE (Napkin)
Paper Converting Machine Co.
John Waldron Corp.

EMBOSSING ROLLS
Textile Finishing Mchy. Co.

ENGINEERS
Little, Inc., Arthur D.
Orthmann Laboratories, Inc.

ENVELOPE MACHINES
Potdevin Machine Co.

ESTIMATES
Chemi-pulp Process Inc.

EVAPORATORS
Murray, D. J. Mfg. Co.

EXTRACTORS
Valley Iron Works Co.

FANS
E. D. Jones & Sons Co.
Ross Engineering Corp., J. O.
The Duriron Co.

FAN PUMPS
Beloit Iron Works
Lawrence Mach. and Pump Co.
Moore & White Co.
Valley Iron Works Co.
Smith & Winchester Mfg. Co.

FANS (Ventilating)
Perkins & Son, Inc., B. F.
Ross Engineering Corp., J. O.

FEED WATER HEATER
Stickles Steam Specialties Co.

FELTS AND JACKETS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bulkley, Dunton & Co.
Draper Bros. Co.
Fitchburg Duck Mills
Huyck & Son, E. C.
Knox Woolen Co.
Lockport Felt Co.
Orr Felt & Blanket Co.
Philadelphia Felt Co.
Shuier & Benninghofen
Turner, Halsey Co.
Waterbury Felt Co.

FELT CARRIER ROLLS
Beloit Iron Works
Downingtown Mfg. Co.

FELT CLEANERS
Magnus Chemical Co.
Magnuson Products Corp.

FELT SOAPS
Magnus Chemical Co.
Magnuson Products Corp.

FELT TIGHTENER (Automatic)
John Waldron Corp.

FILTERS
Glens Falls Machine Works
Inversand Company
Moore & White Co.
J. O. Ross Engrg. Corp.
Oliver United Filters, Inc.

FILTER CLEANERS
Magnus Chemical Co.

FILTER WIRES
Appleton Wire Works
Oliver United Filters Inc.

FILTERING SYSTEMS
Hungerford & Terry, Inc., The
Oliver United Filters Inc.

FITTINGS
The Duriron Co.

FIXTURES (Towel, Toilet, Napkin)
Griffith Hope Co.

FLAT SCREENS
Beloit Iron Works
Bird Machine Company
Downingtown Mfg. Co.
Glen Falls Machine Co.

FLEXIBLE COUPLINGS
De Laval Steam Turbine Co.
Emerson Mfg. Co.
John Waldron Corp.

FLOOR TILE (Non-Slip)
Carborundum Co.
Norton Co.

FLOW METER
General Electric Co.

FLY BARS
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Jones & Sons Co., E. D.

FOLDING MACHINES
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

FOURDRINIER WIRES
Appleton Wire Works
International Wire Works
Wisconsin Wire Works

FOURDRINIER WIRES (Rolled)
Wisconsin Wire Works

FRICTION CALENDERS
Perkins & Son, Inc., B. F.
Textile Finishing Mchy. Co.

FRICTION CLUTCHES
Beloit Iron Works
Moore & White Co.

FUME DUCT (Acid Resistant)
The Duriron Co.

GEARS
Emerson Mfg. Co.
Farrel-Birmingham Co.
De Laval Steam Turbine Co
E. D. Jones & Sons Co.
John Waldron Corp.

GEARS (Machine Cut)
Emerson Mfg. Co.
Farrel-Birmingham Co.
De Laval Steam Turbine Co. Limited, Charles

GEARS AND PINIONS
Emerson Mfg. Co.
Farrel-Birmingham Co.
Moore & White Co.

GENERATORS
De Laval Steam Turbine Co
General Electric Co.

GRANITE ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
Perkins & Son, Inc., B. F.

GRATING (Sidewalk)
Hendrick Mfg. Co.

GREY IRON CASTINGS
Farrel-Birmingham Co.

GRID UNIT
Murray Mfg. Co., D. J.

GRINDER VALVES
Glens Falls Machine Works

GRINDERS
Montague Machine Co.

GRINDING WHEELS
Carborundum Co.
Norton Co.

GROUND WOOD
Borregaard Co., Inc.
Lagerloef Trading Co.

GUIDES (Automatic Web)
John Waldron Corp.

GUIDES (FELT)
Moore & White Co.

GUMMED TAPE TESTERS
Thwing Instrument Co.

GUMMING AND GLUING MACHINERY
Potdevin Machine Co.
Waldron Corporation, John

GUMMED SEALING TAPE
Paper Manufacturers Co.

HAND CLEANER
Magnus Chemical Co.
Magnuson Products Corp.

HAND CLEANER DISPENSERS
Magnus Chemical Co.

HEATERS (Unit)
J. O. Ross Engrg. Corp.

HEATING AND VENTILATING SYSTEMS
Ross Engineering Corp., J. O.
Stickles Steam Specialties Co.

HIGH DENSITY THICKENERS
Oliver United Filters, Inc.
Moore & White Co.

HOISTS (ELECTRIC)
General Electric Co.

HYDRAULIC MACHINERY
Farrel-Birmingham Co.

HYDRAULIC TURBINES
De Laval Steam Turbine Co.

HYDROGEN-ION APPARATUS
Cambridge Instrument Co.

HYGROMETERS, PAPER STOCK
Cambridge Instrument Co.

INTERFOLDING MACHINES
Paper Converting Machine Co., Inc.

JORDAN ENGINES
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

JORDAN FILLINGS
Bahr Bros. Mfg. Co., The
John W. Bolton & Sons, Inc.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

KETTLES (Acid Resistant)
The Duriron Co.

KNIVES, ETC.
Dilts Machine Works, Inc.
Emerson Mfg. Co.
John W. Bolton & Sons, Inc.
Taylor Stiles & Co.

KNOT BORING MACHINES
DeZurik Shower Co.

KNOT SAWING MACHINES
DeZurik Shower Co.

KNOTTERS
Glens Falls Machine Co.

LABORATORY EQUIPMENT
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Thwing Instrument Co.
Valley Iron Works

LACING, BELT
Flexible Steel Lacing Co.

LATEX
George D. Krats

LATHES
Hydraulic, Stone, Sharpening
Montague Machine Co.

LAY BOYS
Moore & White Co.

LIME MUD FILTERS
Oliver United Filters Inc.

LIQUID CHLORINE
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

LOFT DRYERS
Ross Engineering Corp., J. O.
John Waldron Corp.

MOTORS
General Electric Co.

MOULDS
Montague Machine Co.

NAPKIN FOLDING MACHINE
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

NAPKIN DISPENSERS
Griffith-Hope Co.

NON-CORROSIVE METALS
Duriron Company Inc., The

OPACIFYING PIGMENT
New Jersey Zinc Co.

OPERATING SURVEYS
Chemipulp Process Inc.

PAINT (ACID RESISTING)
Sleight Bituminous Products Co.

PAINT STRIPPING COMPOUND
Magnuson Products Corp.

PAPER BAG BLANKING MACHINERY
Potdevin Machine Co., The

PAPER BAG MACHINERY
Heinrich Inc., H. H.
Potdevin Machine Co.
Smith & Winchester Mfg. Co.

PAPER BAG MACHINERY (ALL TYPES)
Potdevin Machine Co., The

PAPER BREAK RECORDERS
Thwing Instrument Co.

PAPER CUTTERS
Hamlet Machine Company
Inman Manufacturing Co.
Moore & White Co.
Smith & Winchester Mfg. Co.

PAPER CALENDER ROLLS
Perkins & Son, Inc., B. F.

PAPER CORES
Climax Tube Co.

PAPER DAMPENERS
Perkins & Son, Inc., B. F.

PAPER GUILLOTINE
Heinrich, Inc., H. H.

PAPER DUSTERS
E. D. Jones & Sons Co.
Moore & White Co.

PAPER MANUFACTURERS
Kalamazoo Vegetable Parchment Co.
Oxford Paper Co.
West Virginia Pulp & Paper Co.

PAPER MACHINE HOODS
Ross Engineering Corp., J. O.
Stickles Steam Specialties Co

PAPER MACHINE SLICES
Montague Machine Co.

PAPER MILL SUPPLIES
Castle & Overton, Inc.

PAPER AND BOARD CUTTERS
Beloit Iron Works
Downingtown Mfg. Co.
Emerson Mfg. Co.

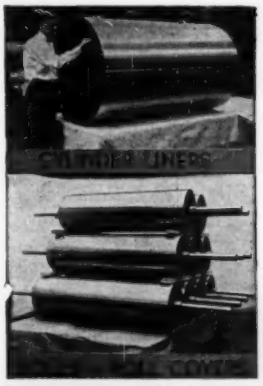
PAPER AND PULP MACHINERY
Beloit Iron Works
Bird Machine Co.
Clark-Aiken Co.
Davis, Frank H.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Glens Falls Machine Co.
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Lobdell Car Wheel Co.
Moore & White Co.
Paper & Textile Machinery Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co
Valley Iron Works Co

PAPER AND PULP MILL BROKERS
Gibbs-Brower Co.

Classified Index to Advertisers

PAPER SCALES
Thwing Instrument Co.
PAPER STOCK DEALERS
Castle & Overton, Inc.
PAPER STOCK WASHERS
Downingtown Mfg. Co.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
PAPER SCREENS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
PAPER TESTERS
Perkins & Son, Inc., B. F.
Thwing Instrument Co.
Valley Iron Works Co.
PAPER TUBES
Climax Tube Co.
PAPER TUBE MACHINERY
Dietz Machine Works
Samuel M. Langston Co.
Potdevin Machine Co., The
PAPER WAXING MACHINERY
Gibbs-Brower Co.
Potdevin Machine Co.
Waldron Corporation, John
PENESCOPE PENETRATION TESTER
Thwing Instrument Co.
PERFORATING MACHINES
Dietz Machine Works
Waldron, John, Corp.
PERFORATED METAL
Harrington & King Perforating Co.
Hendrick Mfg. Co.
PIPE (Drain)
The Duriron Co
PIPE (Stainless)
National Tube Co.
Mundt & Sons, Charles
PLATING, CHROMIUM
Chromium Corp. of America
PLATERS
Perkins & Son, Inc., B. F.
PLAYING CARD MACHINERY
Waldron, John, Corp.
POWER TRANSMISSION EQUIPMENT
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
PRECISION INSTRUMENTS
Thwing Instrument Co.
PRESSES (Napkin)
Paper Converting Machine Co.
PRESS ROLLS
American Wringer Co., Inc.
Beloit Iron Works
Downingtown Mfg. Co.
Emerson Mfg. Co.
Goodrich Rubber Co.
Montague Machine Co.
Stowe-Woodward, Inc.
Valley Iron Works Co.
PRESS ROLLS (Granite)
Beloit Iron Works
Perkins & Sons, Inc., B. F.
PRESSURE BULKER
B. F. Perkins & Son, Inc.
PRESSURE CONTROL SYSTEMS
Stickles Steam Specialties Co.
PRINTING MACHINES
Heinrich, Inc., H. H.
Waldron, John, Corp.
PRINTING PRESSES
Paper Converting Machine Co., Inc.
PULLEYS
Emerson Mfg. Co.
Montague Machine Co.
PULPERS
E. D. Jones & Sons Co.
Emerson Mfg. Co.
PULPSTONES
Carborundum Co
Norton Co.
PULP DECKERS
Bird Machine Company
PULP GRINDERS
Glens Falls Machine Works
PULPS (KRAFT)
Borregaard Co., Inc., The
Lagerloef Trading Co., Inc.
PULP PRESSES
Farrel-Birmingham, Co.
PULP SCREENS
Bird Machine Company
E. D. Jones & Sons Co.
Trimbey Machine Works
PULPS (SULPHITE)
Lagerloef Trading Co., Inc.
Anderson Co. J.
Borregaard Co.
Castle, Overton, Inc.
Perkins-Goodwin Co.
Price & Pierce Ltd.
PULPS (MECHANICAL)
Lagerloef Trading Co., Inc.
PULP TESTING
Little, Inc., Arthur D.
PULP THICKENERS
Bird Machine Company
Glens Falls Machine Co.
Moore & White Co.
Oliver United Filters Inc.
PUMP PRIMERS (Steam and Water Jet)
Lawrence Mach. and Pump Co.
Valley Iron Works Co.
Warren Steam Pump Co.
PULP WASHERS
Bird Machine Company
Glens Falls Machine Works
Oliver Continuous Filter Co.
PULP WOOD MACHINERY
Montague Machine Co.
PUMPS (Acid)
The Duriron Co.
De Laval Steam Turbine Co
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Acid Centrifugal)
De Laval Steam Turbine Co.
The Duriron Co.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Moore & White Co.
Morris Machine Works
Oliver United Filters Co.
Valley Iron Works
Warren Steam Pump Co.
PUMPS (Centrifugal)
Lawrence Pump & Engine Co.
Moore & White Co.
Morris Machine Works
PUMPS (Measuring)
The Duriron Co.
Lawrence Pump & Engine Co.
PUMPS (Reciprocating)
The Duriron Co.
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Rotary Cycloidal)
Lawrence Mach. and Pump Co.
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Stuff)
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Warren Steam Pump Co.
PUMPS (Stock)
Lawrence Pump & Engine Co.
Morris Machine Works
Warren Steam Pump Co.
PUMPS (Suction)
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
PUMPS (Vacuum)
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Morris Machine Works
Warren Steam Pump Co.
PYROMETERS (Roll)
Cambridge Instrument Co.
Thwing Instrument Co.
RAG CUTTERS
Clark-Aiken Co.
Perkins & Son, Inc., B. F.
Taylor Stiles & Co.
RAG CUTTER KNIVES
John W. Bolton & Sons, Inc.
RECORDING INSTRUMENTS
Cambridge Instrument Co.
Thwing Instrument Co.
RECORDING TACHOMETERS
General Electric Co.
RECOVERY SYSTEMS (Waste Heat)
J. O. Ross Engrg. Corp.
RECOVERY SYSTEMS (Soda & Sulphite)
Ross Engineering Corp., J. O.
REDUCTION GEARS
Farrel-Birmingham Co.
REELS (Upright & Revolving)
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Moore & White Co.
REFINERS (Centrifugal)
Bahr Bros.
Bird Machine Co.
REFINING ENGINES
Emerson Mfg. Co.
Jones & Son Co., E. D.
REFRACTORIES
Carborundum Co.
Norton Co.
REGULATORS
Merritt Engrg. & Sales Co., Inc.
Trimbey Machine Works
REWINDERS
Beloit Iron Works
Cameron Machine Co.
Downingtown Mfg. Co.
Inman Manufacturing Co.
Samuel M. Langston Co.
Moore & White Co.
Smith & Winchester Mfg. Co.
John Waldron Corp.
ROD MILL
Mine & Smelter Supply Co.
ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
ROLL SLITTING MACHINES
Cameron Machine Co.
Samuel M. Langston Co.
ROLL STANDS
Cameron Machine Co.
Moore & White Co.
ROLL WINDING MACHINES
Cameron Machine Co.
ROLLS (Chilled Iron & Gray Iron)
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
ROLLS (Embossing)
Perkins & Son, Inc., B. F.
John Waldron Corp.
ROLLS (Calender)
Farrel-Birmingham Co.
Perkins & Son, Inc., B. F.
Textile Finishing Machinery Co.
Smith & Winchester Mfg. Co.
John Waldron Corp.
ROLLS(Granite, Couch, Felt.)
Montague Machine Co.
ROLLS (Paper)
John Waldron Corp.
Goodrich Rubber Co.
Montague Machine Co.
ROLLS (Rubber or Rubber Covered)
American Wringer Co.
Emerson Mfg. Co.
Montague Machine Co.
ROSIN SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
Paper Makers Chemical Co.
ROTARY PULP SCREENS
Bird Machine Company
E. D. Jones & Sons Co.
ROTARY PRINTING PRESSES
Potdevin Machine Co., The
ROTARY SCREENS
Bird Machine Co.
Moore & White Co.
Valley Iron Works
RUBBER COVERED ROLLS
American Wringer Co.
Emerson Mfg. Co.
Stowe-Woodward, Inc.
SAND & POLISHING MACHINES
Carborundum Co.
Waldron, John, Corp.
SATURATING MACHINES
Moore & White Co.
Waldron, John, Corp.
SAVEALLS
Bird Machine Co.
De Laval Steam Turbine Co.
Glens Falls Machine Works
Moore & White Co.
Oliver United Filters Inc.
SCORE TESTERS
Thwing Instrument Co.
SCREEN PLATE
Hendrick Mfg. Co.
Union Screen Plate Co.
SCREENS
Beloit Iron Works
Bird Machine Co.
Downingtown Mfg. Co.
Glens Falls Machine Works
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
Valley Iron Works
SEALING TAPE (Gummed)
Paper Manufacturers, Inc.
SHEAVES
Montague Machine Co.
SHOWER PIPES
Bird Machine Company
DeZurick Shower Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Mfg. Co.
Smith & Winchester Mfg. Co.
SHOWER PIPES (Foam Laying)
DeZurick Shower Co.
SHOWER PIPES (White Water)
DeZurick Shower Co.
SHREDDERS (Pulp and Paper)
E. D. Jones & Sons Co.
Taylor Stiles & Co.
SILICATE OF SODA
American Cyanamid & Chemical Corp.
Philadelphia Quartz Co.
SIZING PROCESS
Bennett, Inc.
SLASHERS
Murray, D. J., Mfg. Co.
SLIME REMOVER
Magnus Chemical Co.
Magnuson Products Corp.
SLITTERS AND REWINDERS
Beloit Iron Works
Cameron Machine Co.
Dietz Machine Works
Inman Manufacturing Co.
Langston Co., Samuel M.
Moore & White Co.
Smith & Winchester Mfg. Co.
Waldron Corporation, John
SOAP POWDER
Magnus Chemical Co.
Magnuson Products Corp.
Paper Makers Chemical Corp.
SODA ASH
American Cyanamid & Chemical Corp.
Diamond Alkali Company
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Process Co.
SOLVENT SIZING
Beloit Iron works
SORTING TABLES
Moore & White Co.
SPECIAL MACHINERY
Emerson Mfg. Co.
Farrel-Birmingham Co.
Montague Machine Co.
Paper Converting Machine Co., Inc.
John Waldron Corp.
SPEED CHANGES (Variable)
Moore & White Co.
SPEED REDUCERS
Beloit Iron Works
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
SPEED REDUCERS (Herring Bone)
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
SPEED REDUCING GEARS (Double Helical)
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
SPIRAL BEVEL GEARS DRIVE STANDS
Beloit Iron Works
Moore & White Co.
STAIR TREADS
Carborundum Co.
Norton Company.
STAIR and FLOOR TILES—(Non-Slip)
Carborundum Co.
Norton Company.
STARCH
American Cyanamid & Chemical Corp.
Corn Products Refining Co.
STEAM SEPARATORS
Stickles Steam Specialties Co.
STEEL PLATE CONSTRUCTION
Downingtown Iron Works
STEAM TRAPS
Stickles Steam Specialties Co.
STEAM TURBINES
Terry Steam Turbine Co., The
STEAM VALVES
Stickles Steam Specialties Co.
STEEL (Electric Furnace)
Timken Roller Bearing Co.
STEEL (Open Hearth)
Timken Roller Bearing Co.
STEEL (Stainless)
American Sheet & Tin Plate Co.
Jones & Sons Co., E. D.
STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co.

STOCK CUTTERS
Perkins & Sons, Inc., B. F.
STOCK REGULATORS
DeZurick Shower Co.
Merritt Engineering & Sales Corp., The
Trimbey Machine Co.
STUFF CHESTS
Jones & Sons Co., E. D.
Lawrence Mach. and Pump Co.
Moore & White Co.
Valley Iron Works Co.
STRAW MAKING MACHINERY
Samuel H. Langston Co.
STUFF PUMPS
Beloit Iron Works
Emerson Mfg. Co.
Morris Machine Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Warren Steam Pump Co.
SUCTION BOX COVERS
Moore & White Co.
SUCTION ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
SULPHITE (Bleached and Unbleached)
Andersen & Co., J.
Borregaard Co., Inc., The
Brown Co., Inc.
Castle & Overton, Inc.
Perkins-Goodwin Co.
Price & Pierce Ltd.
SULPHUR
American Cyanamid & Chemical Corp.
Texas Gulf Sulphur Co.
SULPHUR FURNACES
Glens Falls Machine Works
SUPERCALENDER
Perkins & Son, Inc., B. F.
TABLE ROLLS
American Wringer Co.
Beloit Iron Works.
Downingtown Mfg. Co.
TANKS (Acid)
The Duriron Co.
TANKS (Water, Oil, Etc.)
Hendrick Mfg. Co.
TANK OUTLETS (Acid Resistant)
The Duriron Co.
TEAR TESTERS
Thwing Instrument Co.
TEMPERATURE RECORDERS
Cambridge Instrument Co.
General Electric Co.
Thwing Instrument Co.
TENSILE TESTERS
Perkins & Sons, Inc., B. F.
TESTERS (Bursting Strength)
Perkins & Son, Inc., B. F.
TESTING LABORATORY
E. I. DuPont De Nemours & Co., Inc.
Electrical Testing Laboratories.
Little, Inc., Arthur D.
THICKENERS
Bird Machine Company
TOILET FOLDING MACHINES
Paper Converting Machine Co., Inc.
TOILET WINDERS
Cameron Machine Co.
Dietz Machine Works
TOWEL CABINETS
Griffith-Hope Co.
TOWEL INTERFOLDING MACHINES
Dietz Machine Works
TOWEL FOLDING MACHINES
Paper Converting Machine Co., Inc.
TOWEL WINDERS
Cameron Machine Co
TRACTION CLARIFIER
Dorr Company, The
TRANSMISSION MACHINERY
Beloit Iron Works
Bird Machine Company
De Laval Steam Turbine Co.
Farrel-Birmingham, Co.
Timken Roller Bearing Co
TREADS (Non-Slip)
Carborundum Co.
Norton Company
TRUCKS
Moore & White Co.
TUBES (Paper)
Climax Tube Co.
Elixman Paper Core Co.
TUBING (Seamless Steel)
National Tube Co
Timken Roller Bearing Co.
TUBS (Wood)
De Laval Steam Turbine Co.
Emerson Mfg. Co.
TURBINES (Hydraulic)
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
TURBINES (Water)
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
TURBO-GENERATORS
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
VACUUM PUMPS
Paper & Textile Machy. Co.
Oliver United Filters, Inc.
VALVES
DeZurick Shower Co.
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Stickles Steam Specialties
Trimbey Machine Works
VALVES (Acid Resistant)
The Duriron Co.
VALVES (Blowoff)
The Duriron Co.
VALVES (Automatic Water Control)
Merritt Engineering & Sales Corp., The
VALVES (Check)
The Duriron Co.
VALVES (Foot)
The Duriron Co.
VALVES (Gate)
The Duriron Co.
VALVES (Lubricated)
The Duriron Co.
VALVES (Plug)
The Duriron Co.
VALVES (Plunger Release)
The Duriron Co.
VALVES (Reducing)
Stickles Steam Specialties Co
VALVES (Regulating)
Stickles Steam Specialties Co
VALVES (Safety)
The Duriron Co.
VALVES (Absorption System)
Ross Engineering Co., J. O.
Stickles Steam Specialties Co
VALVES (Y)
The Duriron Co.
VENTILATING SYSTEMS
J. O. Ross Engrg. Corp.
WASHERS
Bird Machine Company
Emerson Mfg. Co.
Glens Falls Machine Co.
E. D. Jones & Sons Co.
WASHING ENGINES
E. D. Jones & Sons Co.
Emerson Mfg. Co.
WATER FILTERS
Hungerford & Terry, Inc., The
WATERPROOFING PAPER
George D. Kratz
WATER SOFTENERS
Hungerford & Terry, Inc., The
Inversand Company
WAXING MACHINERY
Potdevin Machine Co., The
Waldron, John, Corp.
WAX SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
Paper Makers Chemical Corp.
WET MACHINES
Downingtown Mfg. Co.
Emerson Mfg. Co.
Glens Falls Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
WHITE WATER SAMPLERS
DeZurick Shower Co.
WINDERS
Beloit Iron Works
Cameron Machine Co
Downingtown Mfg. Co.
Langston Co., Sam L.
Moore & White Co.
Smith & Winchester Mfg. Co
WIRE CLEANERS
Magnus Chemical Co.
Magnuson Products Corp.
WIRE GUIDE ROLLS
American Wringer Co.
WIRE GUIDES
Moore & White Co.
John Waldron Corp.
WIRE STRETCH ROLLS
American Wringer Co.
Valley Iron Works Co
WOOD CLEANING MACHINERY
DeZurik Shower Co.
WOOD PULP
Lagerloef Trading Co.
WOOD SPLITTERS
Moore & White Co.
WORMED CUTTERS
American Wringer Co.
ZINC OXIDE PIGMENT
New Jersey Zinc Co.
ZINC SULPHIDE PIGMENT
New Jersey Zinc Co.



Do You Know ? ?

that—

Sandusky Centrifugally Cast Products are used in practically every Paper Mill in North America.

that—

Sandusky Products are made in Bronze, Brass, Copper, Monel, Nickel Alloys and Aluminum.

that—

They are made in diameters from 3"-46" and in lengths up to 330".

THAT **each and every purchase of Sandusky Products for new and replacement projects is a long term investment in service.**

Bulletin 532

* * *

SHOWER PIPES

Have you a machine that would be benefited by permanently reduced shower pipe costs?

Bulletin 121

ALPHABETICAL INDEX TO ADVERTISERS

Amer. Cyanamid & Chem. Corp. 52
American Engrg. Co. 15
Amer. Sheet & Tin Plate Co. ... 108
American Wringer Co., Inc.... —
American Writing Paper Co... 94
Andersen & Co., J. 106
Appleton Wire Works, Inc. 117
Appleton Woolen Mills 46
Asten-Hill Mfg. Co. 6

Bahr Bros. Mfg. Co. ..... —
Bausch & Lomb Optical Co. ... —
Beloit Iron Works 3
Bennett, Inc. 2
Borregaard Co., The 108
Bowsher & Co., N. P. 117
Brown Company 86
Bulkley, Duntin & Co. .....
Front Cover & 112

Cambridge Instrument Co. 104
Cameron Machine Co. 110
Canadian Elixman Co. 64
Carborundum Co. 60
Casein Manufacturing Co. of America ..... —
Castle & Overton, Inc. ..... —
Chain Belt Co. 16
Champion International Co. 92
Chillicothe Paper Co. 92
Chromium Corp. of America .. 7
Climax Tube Co. ..... —
Clinton Corn Syrup Refining Co. —
Continental Paper & Bag Co. ... 108
Corn Products Refining Co. .. —

Davis Co., Frank H. 118
De Laval Steam Turbine Co. .. 50
De Zurik Shower Co. ..... —
Diamond Alkali Works ..... —
Dietz Machine Works 119
Diltz Machine Works, Inc. 38
Dodge Mfg. Corp. 70
Downingtown Mfg. Co. 36
Draper Bros. Co. 106
Du Pont de Nemours & Co., E. I. —
Duriron Company, Inc., The ... 19

Eastwood Nealley Corp. Back Cover
Edgar Bros. Company 96
Electro Bleaching Gas Co. 67, 68
Electrical Testing Laboratories . —
Elixman Paper Core Co. 64
Esleeck Mfg. Co. 98
Esselen, Gustavus J. .....

Fabricated Steel Products Co. .. —
Farrel-Birmingham Co., Inc. ... —
Ferguson & Co., Hardy S. 117
Fifth Avenue Bldg., The 48
Fitchburg Duck Mills ..... —
Fitchburg Paper Co. 90
Flexible Steel Lacing Co. ..... —
Fuess, Inc., R. 4

Geigy Company, Inc. ..... —
General Chemical Co. 104
General Dyestuff Corp. ..... —
General Electric Co. ..... —
Gilman Paper Co. 119
Glens Falls Machine Works 104
Goodrich Rubber Co., The B. F. —
Goodyear Tire & Rubber Co. .. —
Gottesman & Co., Inc. 20
Great Western Electro-Chemical Co. ..... —
Griffith Hope Co. ..... —

Hamblet Machine Co. 62
Hammermill Paper Co. 100
Hardy, George F. 76, 117
Harrington & King Perforating Co. 119
Heinrich, H. H., Inc. ..... —
Heller & Merz Corp. 106
Hendrick Mfg. Co. 117
Hubbs & Co., Chas. F. 102
Hungerford & Terry, Inc. ..... —
Huyck & Sons, F. C. ..... —

Illinois Steel Co. 5
Inman Mfg. Co. 106
International Paper Co. 90, 125
International Pulp Co. ..... —
International Wire Works 117

Jenssen Co., G. D. ..... —
Jones & Sons Co., E. D. ..... —

See pages 120, 121, 122 and 123 for Classified List of Products and Their Manufacturers.

Kalamazoo Vegetable Parchment Co. 8
Keith Paper Co. 86
Knox, Woolen Co. .....
Front Cover & 112
Kratz, George D. ..... —

Lagerloef Trading Co., Inc. .... —
Langston Co., Samuel M. 117
Lawrence Machine & Pump Co. 117
Lawrence Pump & Engine Co. .. 116
Lefren, Inc., Karl A. 117
Lindsay Wire Weaving Co. 56
Little, Arthur D., Inc. 117
Lobdell Car Wheel Co. 14
Lockport Felt Co. 6
Lockwood's Directory 98

Magnus Chemical Co. 108
Mathieson Alkali Works ..... —
Mead Corp., The 88
Merritt Engineering & Sales Co. 11
Michigan Steel Casting Co. ... 10
Mine & Smelter Supply Co. .... —
Montague Machine Co. 18
Moore & White Co. 58
Morris Machine Works 8
Mundt & Sons, Charles 117

Nashua Gummed & Coated Paper Co. 94
National Aniline & Chemical Co. —
National Tube Co. ..... —
New Jersey Zinc Co. ..... —
Norton Co. ..... —

Orr Felt & Blanket Co. ..... —
Oxford Paper Co. 54

Pagel-Horton Co. 40
Paper & Industrial Appliances, Inc. ..... —
Paper & Textile Machinery Co. . 123
Paper Converting Machine Co. . 12
Paper Makers Chemical Corp. .. 74
Paper Manufacturers Co., Inc. .. 119
Pennsylvania Salt Mfg. Co. .... —
Perkins & Sons, Inc., B. F. ... —
Perkins Goodwin Co. 44
Philadelphia Felt Co. 112
Philadelphia Quartz Co. 110
Pickles, W. F. ..... —
Potdevin Machine Co. 112
Price and Pierce, Ltd. 110
Pulp & Paper Trading Co. 106

Ross Engineering Corp., J. O. .. —

Shuler & Benninghofen 9
Simons, V. D. ..... —
S.K.F. Industries 72
Sleight Bituminous Products Co. —
Smith-Taber 12
Smith & Winchester Mfg. Co. .. 13
Solvay Sales Corp. 116
St. Louis Gumming Corp. 88
Stickles Steam Specialty Co. ... 14
Stowe-Woodward, Inc. 17

Taylor Instrument Co. ..... —
Taylor, Stiles & Co. 100
Terry Steam Turbine Co. ..... —
Texas Gulf-Sulphur Co. 112
Textile Finishing Machinery Co. —
Thwing Instrument Co. 10
Ticonderoga Mach. Works 110
Ticonderoga Pulp & Paper Co. . 102
Tileston & Hollingsworth Co.. 116
Timken Roller Bearing Co. .... —
Titanium Pigment Co., Inc. 16
Trimbey Machine Works 4
Turner, Halsey Co. ..... —

Union Screen Plate Co. ..... —
United Carbon Co. ..... —

Vacuum Oil Co. ..... —
Valley Iron Works Co. ..... —
Vanderbilt Co., R. T. ..... —

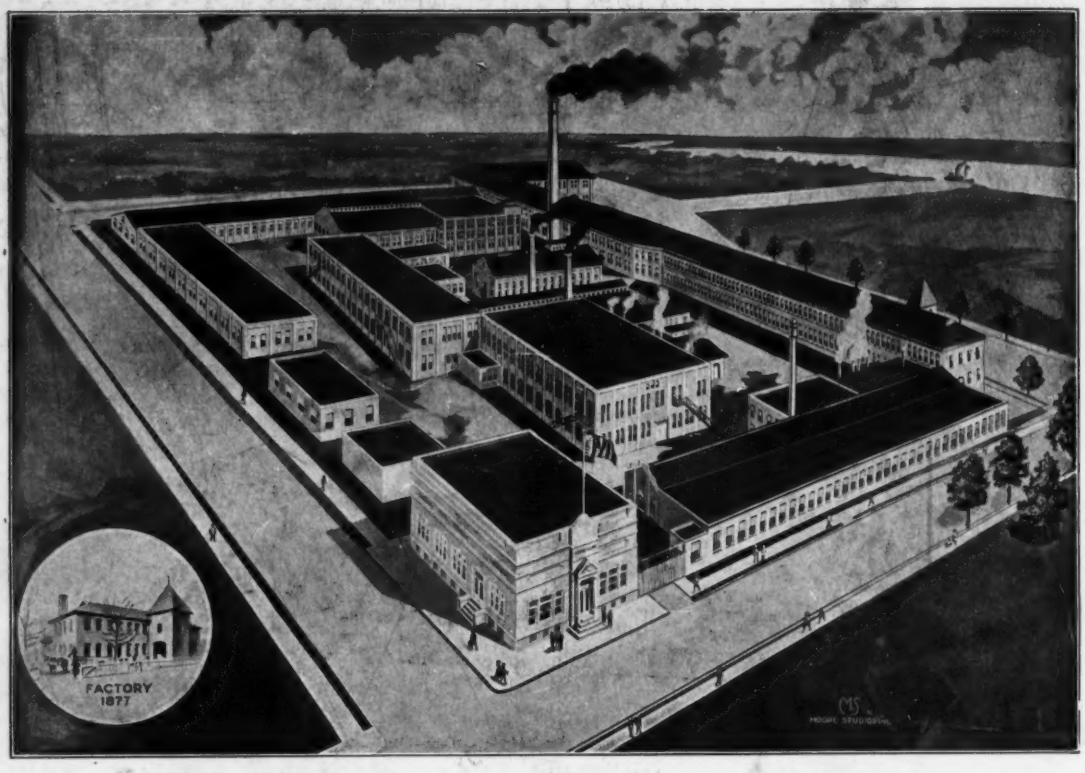
Waldron Corp., John 116
Warren Steam Pump Co. ..... —
Warner Chemical Co. 84
Waterbury Felt Co. ..... —
West Virginia Pulp & Paper Co. 42, 104
Williams & Co., C. K. ..... —
Wood Products Industries .... —

International Paper Company

220 East 42nd Street, New York, N. Y.

Herbert Lippitt, Sales Manager—Core Department

Samples and Particulars Furnished on Request



This Illustration Visualizes Fifty-Six Years of Progressive Growth and Unsurpassed Achievements in the Production of

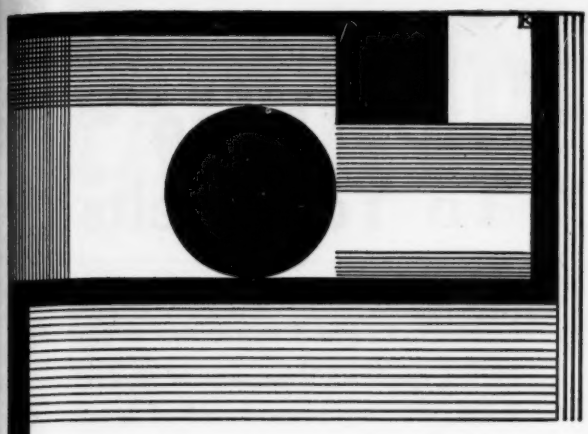
EASTWOOD

FOURDRINIER-CYLINDER-WASHER

WIRES

EASTWOOD-NEALLEY CORPORATION,

Belleville, N. J., U. S. A.



BE
COLOR WISE
and use
GENERAL'S DYESTUFFS
WHY?

A dyestuff for every requirement carefully standardized

Efficient and accurate laboratory and technical service

Localized distributing branches

GDC

GENERAL DYESTUFF CORPORATION

230 FIFTH AVE., NEW YORK, N. Y.

Boston, Mass.
Providence, R. I.
Philadelphia, Pa.
Portland, Oregon
Charlotte, N. C.
Chicago, Ill.
San Francisco, Cal.

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTY-FIRST YEAR

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President. J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 15 West 47th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1933, by the Lockwood Trade Journal Co., Inc.

Technical Men Meet in Philadelphia..... 11
Paper Demand Better in Chicago..... 12
Paper Box Industry Expands..... 12
Indianapolis Demand Improves..... 13
Box Board Plants Active..... 13
Ontario Mills Operate on Reduced Scale..... 14
Dryden Paper Can Carry On..... 14
Hinde & Dauch in Good Position..... 15
Lake States TAPPI Discusses Refiners..... 15
Fox River Valley Mill Activities..... 16
Fort Howard Officers Reelected..... 16
Japan Plans to Supply Own Pulp..... 17
Canadian Forestry Association Meets..... 17
Philadelphia Market Conditions Improve..... 18
The Cellophane Industry of Japan..... 21
Old Papermaking in China and Japan..... 22
Manchester Mills Extend Schedules..... 22
Obituary 23
Boston Paper Trade Happenings..... 23
Accident Prevention Awards..... 23
New York Trade Jottings..... 24
Construction News 25
Editorial 26
Empire State Reforestation 27
Harveys Ask Fair Payment..... 27
Crystal Tissue Co. Reports Loss..... 27
Technical Section
The Manufacture of Pulp Insulated Wire.... 29
Patent Committee Annual Report..... 32
An Improved Method for the Analysis of Spent "Black" Liquors from the Soda and the Sulphate Pulping Processes..... 33
Non-Fibrous Raw Materials Testing Committee Report 36
Paper Mill Illumination 37
Index to Technical Section, Vol. 95..... 41
Imports of Paper and Paper Stock..... 47
New York Market Review..... 49
Miscellaneous Markets 50
Market Quotations 50

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 54-55

P. Q. SILICATES OF SODA

THE YEAR 1933 opens up opportunities for you to improve results or cut costs with P.Q. Silicates. The catalog lists 33 P.Q. Silicates, and the uses are as varied. Paper makers can use at least one of these to produce better paper or to obtain it more economically.

Other uses in the mill include lining pulp digesters, capping rolls, washing felts, with a P.Q. Silicate for each.

Key your profits with P.Q. If you have never investigated what silicate will do in your mill, clip the coupon below.

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory
121 S. THIRD ST., PHILADELPHIA

Chicago Sales Office
205 W. WACKER DRIVE

TELL US how many things PQ Silicate can do in our mill. We are interested to investigate them.

.....

.....

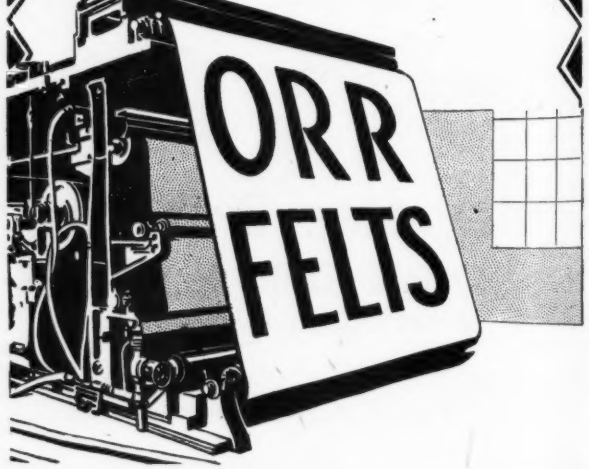
.....

Sold in Canada by NATIONAL SILICATES Ltd., Brantford, Ont.

Be Kind To Your Felts

Watch your bearings. A paper machine in good condition is far easier on felts than one with felt rolls out of line and out of level because of worn or broken down bearings.

Check up on your molds, on your felt rolls, on your bottom press rolls — on any and all operating conditions that either directly or indirectly affect the life of felts.

Above all, use ORR FELTS and keep your felt bills under control. Remember that the ORR LINE is complete—the felt best suited to your particular machine requirements available.

The Orr Felt & Blanket Co.
PIQUA, OHIO